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THE AGRICULTURAL STUDENT

OHIO STATE UNIVERSITY, COLUMBUS, OHIO. *LIBRARY RECEIVED AUG 26 1918*



SEPTEMBER 1918

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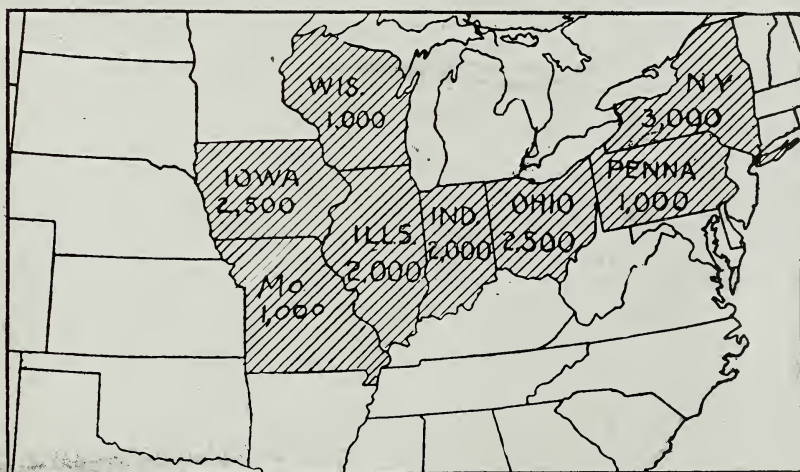
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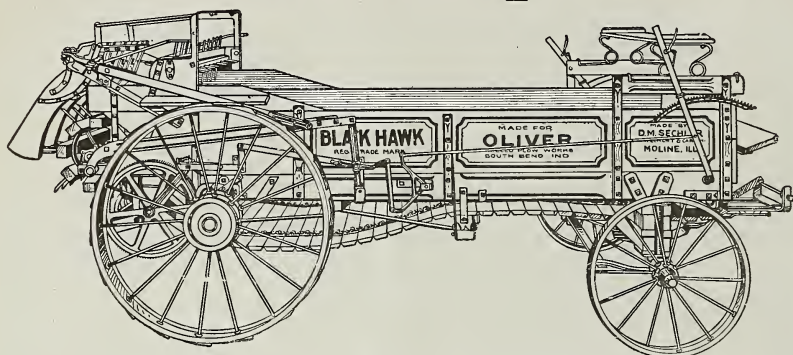
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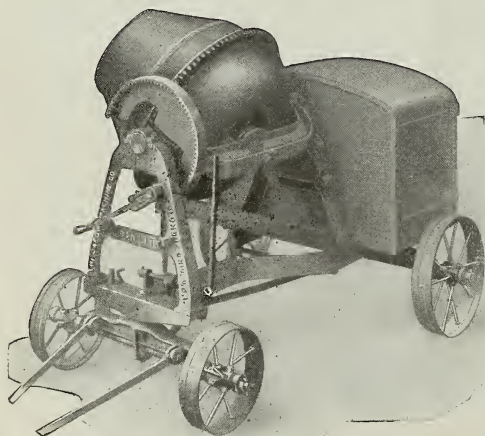
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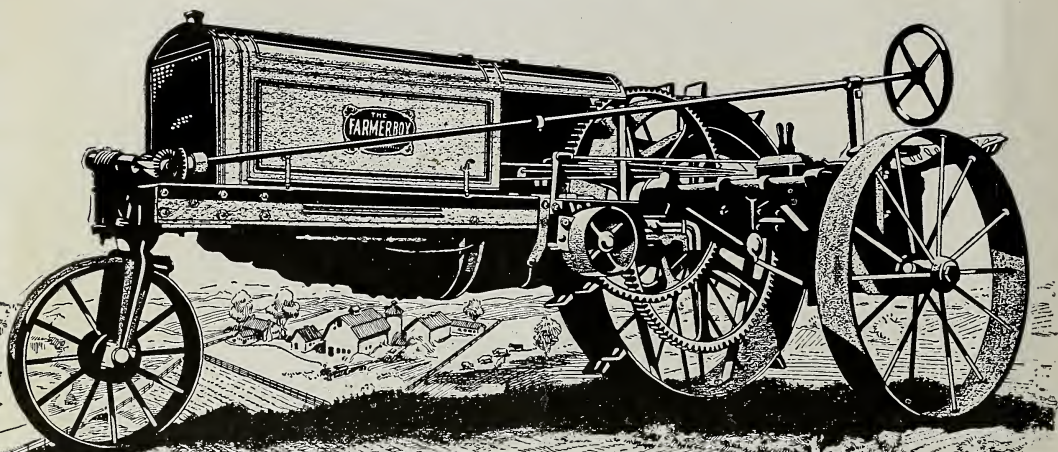
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If any who read this are interested in any phase of our work you are earnestly invited to come to our offices in Ohio Union and talk it over.



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Dedication

To our Farmers' Sons in the War who willingly and gladly laid aside their labors in the field to perform a noble and glorious duty for their country, is this volume of The Agricultural Student Dedicated.

Columbus, Ohio
September
1918

The Agricultural Student

VOL. XXV. OHIO STATE UNIVERSITY, COLUMBUS, OHIO, SEPTEMBER, 1918

No. 1

THE STUDENTS' ARMY TRAINING CORPS

An Article of Vital Interest to the Prospective Student

PRESIDENT W. O. THOMPSON

THE Students' Army Training Corps is a proposal upon the part of the Government as a war policy to organize all the colleges of the country into an effective military asset. The new features are, that all students over eighteen years of age shall enlist as soldiers in the U. S. Army, receive uniforms from the Government and be furloughed back to the college for study. During the summer vacation these enlisted students will attend a six-weeks' camp receiving mileage to and from camp, subsistence while in camp and the pay of a private. At the end of their course these students would be subject to military service, of course, but the announced purpose of the Government is not to call the enlisted students into military service unless a great emergency should require it.

No commissions are assured as a result of this enlistment, but the fact remains that students with such experience would be the most probable source of officers, and would be sent to Officers' Training Camps in large numbers.

This plan was developed under the existing service law, and therefore provided that when students became twenty-one years of age they would register and subsequently be furloughed back to college to complete their education unless there were military reasons to the contrary.

Now that the law may be changed lowering the military age from twenty-one to eighteen, no official announcement has been made as to the effect of the change upon the policy of the Students' Army Training Corps. The officials having the matter in charge have said that the plan for the colleges as above outlined would be preserved. The Government desires to avoid making students a favored class. Nothing could be more unfortunate than that. At the same time, the importance of educated men is recognized as never before in this war. The Government means to conserve this asset. Young men should recognize the opportunity. It is no time for slackers. Any student who fails in his work under this plan will at once lose his status as a student and be subject to call under the Selective Service law just as if he had never been in College. It should be said that any student under these circumstances who fails in his work except for the very best and most obvious reasons, such as prolonged sickness, should be branded at once as unpatriotic and unworthy of the opportunities afforded for an education. We are in a war not only to drive militarism from the face of the earth, but to save the world from perpetual menace and make the last acre of the earth a habitable place where life, liberty, and the pursuit of happiness may be peacefully enjoyed.

SHALL I GO TO COLLEGE?

DEAN ALFRED VIVIAN

Dean of the Agricultural College, Ohio State University

IN times like the present everyone desires to feel absolutely sure that he is doing his duty to his country. Winning the war is the one great job for the American people at this time, and, naturally, every young man wants to know that he is doing something which will count to that end. America is in this war, as our President has so aptly said, "to make the world safe for democracy," but while that is being done it is equally necessary to make democracy safe for the world. While our boys are winning the war at the front it is quite as important that those at home shall be so trained as best to help the world to reap the advantages of the freedom from autocracy which is to come with the end of the war.

For four long years one nation has held the whole world at bay as the result of forty years of preparation for this purpose. In Germany every man, woman, and child has been mobilized and made to contribute to the war. America will win only as her people voluntarily make the sacrifices that have been forced upon the peoples of her enemies. Democracy is in the balance and dares not be found wanting.

Germany realizes that the war will not be ended when the last battle is fought. The principles of autocracy and democracy will forever be at war, and the period of education following will be as important for the world as the war itself. Our enemies are spending more money on education today than they did before the war, and we must have educated men and women by the millions to counteract the effects of the perverted education of modern Germany. Only in this way can a repeti-

tion of the present conflict be prevented.

It is becoming more and more evident to those in power that our educational institutions must be kept running at the highest pitch which is consistent with the building up of a great National Army. The tremendous problems which this war will leave in its wake can be solved only by educated men and women, and there will be need of every possible college trained citizen which the country can produce.

To the young man who is prepared to go to college I, therefore, feel like saying: "You should be in one of two places, either in the Army or in College, for those are the two places in which you can best serve your country at the present time." The late order from the Secretary of War against the enlistment of registered men seems to indicate that the army feels that the young men should go quietly about their civilian pursuits until called into the service. In that case the young man who is prepared to do so should obtain as much education as possible before he enters the army. The attitude of the War Department toward the student remaining in college is also shown in the organization of the Student Army Training Corps which is discussed elsewhere in this magazine.

The above statements refer to college men in general, but we are naturally most interested in the student of agriculture. There never was such need of men educated in agriculture as at the present time, nor has there ever been a time when the demand for such men was so great. This year we had more than three opportunities for every agricul-

tural graduate who was available. We could place a score of such men today if they were to be found, and the call for agriculturally trained men is bound to increase. We are facing a known demand for agricultural college graduates next year which will be far in excess of the supply.

Nothing will be quite the same after this war, and among the changes which will have taken place will be the development of a new attitude toward agriculture on the part of the people at large. Many people have learned for the first time during the past year that the farmer is quite necessary to their comfort if not to their very existence, and the farmer's part in our national economy is being appreciated in a new way. I am firmly convinced that the golden era of agriculture is at hand, and all we need is a large group of properly trained men who can lead the new agriculture into the proper channels.

To you who have been wondering whether you should go to college, this message is addressed. Think seriously about it before you decide to forego your college education. Ask yourself where you can best serve your country, for that is the vital thing today.

The army—the college—the farm—which?

CORN CUTTING NEED NOT REDUCE WHEAT ACREAGE

Fear is expressed by crops specialists that the wheat acreage may be unnecessarily reduced this fall on account of the high cost of harvesting corn. Some farmers declare that inasmuch as the cost of cutting will be high they will husk their corn standing and will replant to corn.

W. E. Hanger, of the Ohio State University College of Agriculture, says

that the wheat may be seeded in the standing corn with a one-horse grain drill. This may be used to apply the acid phosphate in the same way as the two-horse drill. Present indications do not seem to show that there will be any danger from Hessian fly in Ohio, and that it will not be necessary to put off the seeding of wheat until unduly late.

The wheat will come up satisfactorily if the corn is not cut, and will even come up under the shocks if they are removed soon after cutting. In any case, the plants destroyed will only be those directly under the shocks, whereas if the wheat is drilled around the shock, it will not be possible to seed as closely.

HILL SELECTION WILL RAISE POTATO YIELD

Selecting seed potatoes from hills that have resisted disease, show no weaknesses, are true to type and yield high, are mentioned as particular points to be observed at digging time, by officials at the Ohio Experiment Station. Continued selection from high-yielding hills will make it possible to increase the productivity of a variety.

An experiment at the Ohio station shows that a gain of 55 percent was found in the crop from seed chosen from the highest-yielding over that from the lowest-yielding hills. The yield after 2 years of hill selection was 26 percent more than that from the planting the ordinary way.

Continued selection is necessary to get rid of the inferior qualities that appear even after a small patch of hill-selected potatoes have been started. Quality, freedom from disease, and yielding ability will be necessary considerations in each year's selection.

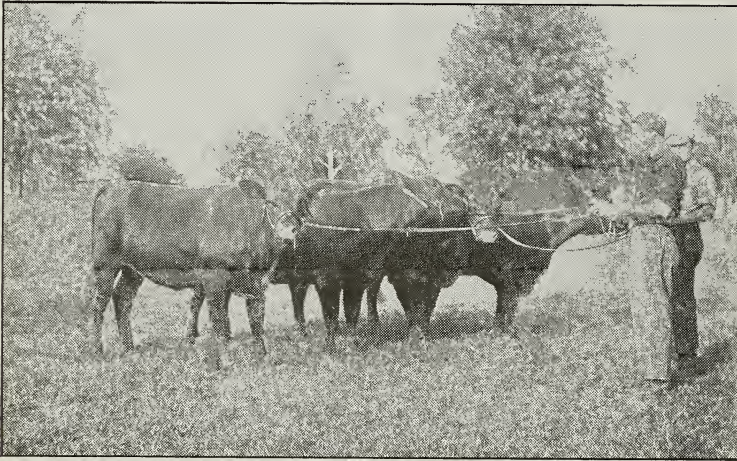
COMMUNITY LIVESTOCK BREEDING

PROF. C. S. PLUMB

Department of Animal Husbandry, Ohio State University

EACH of the breeds of livestock came into existence within limited areas in certain communities. Without any special effort at organization, as we think of it these days, early breeders sought to produce animals suited to their special home conditions. So they worked together as friends and neighbors, reckoning valuable qualities, which

lines. While it is true that over the country as a whole we have many breeders, those engaged in producing pure-bred or high grade stock are a very small percentage of the whole. In other words, as a people we are inferior breeders, lacking in policy, and producing far too many animals of distinctly inferior character. A most common fea-



A Community Should Concentrate Its Attention on One Breed

they endeavored to establish, and looking with disfavor on other things which they sought to eliminate. So in time the breed was a recognized thing, and the people believed it met their special needs. The people of Europe, as a rule, are slow to change, and so they have adhered to their local breeds, in many instances thru long periods of years.

In America, our people have generally lacked the vision of the improver of livestock, and so our farms have become populated with a mixture of blood

ture on an American farm is an animal having in its pedigree more or less of two or more breeds. When one travels across country and sees on a farm what appears to be Jersey, Holstein-Freisian, and Shorthorn in the same field, he must recognize this lack of breeding policy.

In the future livestock development of the country, nothing, as I see it, is of more vital importance than that the farmer or stockman shall recognize the value of breed character, and shall, in a reasonable degree, cooperate with his neighbors in producing animals of the

same kind, as a community movement. There are certain arguments in behalf of such a policy, which may be briefly set forth as follows:

1. *A definite policy of breeding* is the key to success in community breeding. All persons in such an organization agree to breed a certain kind of animal, and devote their efforts toward its improvement. If twenty-five farmers in a neighborhood agree to breed only Jersey cattle, then the farms of these men are not engaged in producing a hopeless mixture of what is frequently undesirable, unprofitable stuff. They are seeking to contribute to the population of desirable, profitable animals, and their policy is clear and unmistakable. We should always keep in mind that the actual value of our flocks and herds is dependent on the man who is producing the purebred animal. If there is but one man breeding purebreds, to twenty producing nondescripts, then the twenty are steadily tearing down where the one is building up. The less attention the individual breeder pays to the improvement of his livestock, the less progress do we, as a people, make in producing profitable, high class animals. In other words, our lack of method is destructive rather than constructive.

2. *One breed of a certain class is better for a community than are several breeds.* There is no question but what in those sections where the people are concentrating their attention on one breed, there is a greater degree of prosperity, than where various breeds are kept. For example, on the island of Jersey one finds but the one breed of cattle. Here the people have one common aim in production, and here buyers find the greatest opportunity to purchase. One may turn to one-breed

communities in other parts of Europe, or may look near home, and he will find this statement to be true. Geauga county, with all its Holstein-Friesians, is a far better livestock proposition than Greene county with its many breeds. Certainly buyers turn to the former county with a much greater prospect of finding what they want, than they would in the latter county. The Ohio county that boasted but one breed of swine would certainly see far more buyers than the county with six breeds. In these days men often buy in carload lots, but to obtain these, they must visit localities where numbers prevail.

3. *Community breeding stimulates prices and trade.* This is due to the fact that in the community the breeders are interested in one another's herds, and desire to purchase the better class of animals for improving their own. Nowhere do we find a more active recognition of values, or greater interest, than in a community where the men are breeding the same kind of stock.

4. *Community breeding promotes confidence.* One of the most injurious factors in American farm life is jealousy. Men get suspicious of each other, and do not cooperate as they should. It has long been said that the farmer cooperates less than any other class of business men. But conditions are changing, and now farmers are beginning to get together, and are having faith in their fellows. This is as it should be. If success attends the efforts of one in the community, others, without doubt, will be more or less favorably influenced. In fact, we should feel proud of the success of any one in a community, rather than to run down his efforts and show jealous criticism.

5. *The small breeder receives recog-*

tion in a community breeders' association. Men come in from without to purchase, and they are taken about among the breeders, so that each man who has stock to sell, has a reasonable chance to see a buyer. The most active breeders' associations publish lists of their memberships, and these are sent out to persons making inquiry. The animal husbandry department of the Ohio State University is constantly receiving inquiry from men in other states as to where certain kinds of animals can be bought in Ohio, and wherever possible, buyers are directed to communities, and information is furnished them, so that they may have as wide an opportunity of purchase as possible. Thus the small breeder gets his chance.

6. *The expense of advertising is reduced* to the man in a community breeders' association. Even if his name is only on the list of members, that is an advantage at a minimum cost. If he engages in special advertising with other members of the association, it costs him less than it would otherwise. There are a number of community associations that are now carrying considerable joint advertising of members. Single-breed papers furnish attractive opportunities for this sort of publicity.

7. *Successful breeding brings fame to a community.* There are a number of examples in Ohio, where fine herds have been developed, such as to bring national fame to these same localities—for example, men interested in breeding Rambouillet sheep in the United States commonly referred to the "Ohio Rambouillet Colony" in northwestern Ohio, from which these sheep were shipped out all over the west in large numbers.

8. *Community breeding interests young people on the farm.* A young

man raised on a farm where the father is engaged in breeding fine animals finds the home and its work far more attractive than does the boy on the farm where nothing in particular is accomplished. The young man in the agricultural school who shows the most interest in livestock husbandry, more often than not comes from a home where something worth while is done in livestock development.

The first regularly organized community breeders' association in America, so far as I am aware, was the Western Reserve Holstein-Friesian Association, established at Burton in Geauga county, Ohio, in 1905.

This was for promoting the Holstein-Friesian breed of cattle, and to add to the social and intellectual attractions in the community. A few years ago the name of this association was changed to the Geauga County Holstein-Friesian Association. It has had a most successful career, and its membership owns several thousand cattle. Buyers visit Geauga county from all over America, and ship out large numbers of cattle, even to foreign countries.

The second community breeders' association organized in America was the Waukesha County Guernsey Breeders' Association, of Wisconsin, established in 1906. Thru its efforts, more Guernsey cattle are kept in this county than in any other county in America, and so also are more Guernsey cattle in Wisconsin than in any other state.

The movement in behalf of community breeders' associations in this country is now well started. On all sides a call is sent out for information on this subject. It is the most vital movement now on in behalf of a better livestock husbandry in America.

RED CLOVER A PROFITABLE CROP

FIRMAN E. BEAR

Department of Soils, Ohio State University

YES, red clover! Not alfalfa or sweet clover or soybeans but ordinary red clover is the subject of this article. If we were to judge the importance of red clover by the number of articles which appear in the agricultural press in its behalf as compared to similar articles concerning certain other members of the legume family we would be compelled to say that red clover no longer played a very important part on the best managed farms. And yet, when we come to examine into the statistics of crop acreages in Ohio, we find that red clover, mammoth, and alsike have a total acreage of over one million, while alfalfa, sweet clover, and soybeans total less than 75,000.

So much has been written of recent years concerning the merits of alfalfa that great numbers of men have been led to give it a trial. As a result of all the advertising which alfalfa has received we are today growing 67,000 acres of this crop. Just now the agricultural press is full of articles on the merits of sweet clover as a crop which has a wonderfully rejuvenating effect on the soil. Soybeans also come in for at least their fair share of advertisement, especially as a crop to be substituted for oats in the rotation. Altogether it would appear that quite a few men have come to the conclusion that red clover is fitted into the rotation as a more or less satisfactory crop for the benefit of the soil only until such time as farmers in general could be made to see the greater merits of these other legumes.

Having been born and reared in the Miami valley where red clover abounds

and is at its best, it is difficult for the writer to picture any other crop which can successfully compete with red clover for a place on the average well-managed farm. In spite of the fact that sweet clover grows abundantly along the roadsides over considerable areas of Western Ohio it has never become a popular plant in these sections. Only very seldom is it found sown as a field crop, altho many men recognize that it is a crop of merit. Great numbers of men have an acre or two, or even ten acres of alfalfa on the farm and are very warm admirers of this plant. Yet the acreage of alfalfa increases very slowly. Occasionally a field of soybeans will be seen as one drives along the road, and they make a very attractive crop. But the total acreage of soybeans in Ohio in 1917 was less than 8000. In fact if we are to sum the matter up as it now stands we must say that less is written about red clover than about any other legume which is grown in Ohio. But yet, in spite of the fact that it has no one to champion its cause, red clover continues to be the one crop which is doing more for the soils of Ohio than any other crop now grown. It is this plant which today is playing a most important part in gathering large amounts of nitrogen from the inexhaustible supply in the air and storing it in the soil for the use of the other staple farm crops on which we depend for food.

It would be interesting to know just what exact evidence we have in favor of red clover. It must be agreed that the comparative evidence between red clover and other legumes is of a very

general nature. Each of the legumes has its enthusiasts and rightly so. Conditions differ, soils differ, men differ, and systems of farming vary, and under certain conditions it would be logical to expect that red clover might suffer by comparison. But it seems desirable to point to just two experiments, in pass-

be recognized that these are high yields when considered on the basis of averages for a period of 35 years.

But experimental work at Pennsylvania and other experiment stations demonstrated that soils will not do their best in crop production unless phosphorus in some form is applied in addi-



Red Clover Is Always a Popular Crop

ing, which throw some light on the value of red clover in the rotation.

Thirty-five years ago the state of Pennsylvania set aside an area of land for experimental purposes. The men in charge of this work laid off the land in four fields and started a rotation of corn, oats, wheat, and clover. A part of the land in each field received an application of 12 tons of manure per acre every four years. During all this period the average yields on this manured soil have been $55\frac{1}{2}$ bushels of corn, 41 bushels of oats, 24 bushels of wheat, and 2 tons of clover hay. It will

tion to the manure. Director Thorne, after demonstrating this fact to his own satisfaction, set aside four fields of ten acres each at Wooster and established on these fields the same rotation as that practiced at the Pennsylvania Experiment Station. But in addition to the manure he applied 700 pounds of acid phosphate to the soil during the rotation, 400 with the manure on the clover sod for corn and 300 pounds with the fertilizer drill on the wheat. The soil in this case needed limestone and 2 tons were applied per acre to the corn. As a result of this treatment the soil has

been built up until the average yield for the last 12 years has been 78 bushels of corn, 65 bushels of oats, 35 bushels of wheat, and 3 tons of clover hay per acre.

Now the question might be asked, what would the yields have been if soybeans, or alfalfa or sweet clover had been substituted for red clover in the rotation. We do not know. But from what statistics show concerning the average yields of corn, oats, and wheat over the state as a whole we feel reasonably well satisfied with the yields secured under this system of treatment. Of course, this does not show directly just what part the red clover played but we have enough evidence to make us believe that no such crops would have been produced if the rotation had been corn, oats, and wheat without the clover.

Does this mean that we are inclined to discourage the growing of other legumes? By no means. Each of these legumes has its place. We need and will grow vastly larger acreages of alfalfa, sweet clover, and soybeans but, this will not be at the expense of red clover. Ohio today, on the average, grows a legume every ten years on her cropped soil. We shall never be able to produce the crops and the stock we should until the acreage of legumes is doubled. As time goes on we can expect to see it trebled. There is plenty of space for all the legumes but not the least among these will always be the old standby—red clover.

It is well to keep in mind that red clover is not a crop which can be used to advantage in building up wornout soils. Red clover will not grow on a poor soil. The soil must be supplied with plenty of available plant food in just the same way as for wheat. The

use of acid phosphate in liberal amounts on the wheat crop is not only for the benefit of the wheat but is especially necessary for the clover crop following. Red clover is a plant which can be used to best advantage in keeping good soils good. As long as this crop is being grown successfully the soil is safe. When red clover fails it is time, not to substitute another legume, but to remedy the conditions which prevent its growth.

NEW VEGETABLE BEING RAISED IN LABORATORY

One of the new vegetables being raised by the department of horticulture at the State University is the whitloof chicory, a plant valuable as a root, a pot bulb and a salad plant. Before the outbreak of the war the root of this plant was imported from foreign countries. Last summer the department of horticulture, realizing the necessity of relying upon domestic supplies, tried to cultivate the plant and found that it could be grown here successfully.

Turkey is starving, Germany pinched, and Austria rioting for food. The Allies are well fed and full of fight, thanks to Uncle Sam who invited them to sit down to his table a year ago—he has been passing around the victuals ever since.

Out of the last harvest the American people, by abstinence, saved 140,000,000 bushels of wheat to feed the hungry Allied nations; and these same people are going to stay right on the sugar job and see it thru.

The past can never be undone. The food you should have conserved will never reach a hungry mouth.

HOME STORAGE OF VEGETABLES

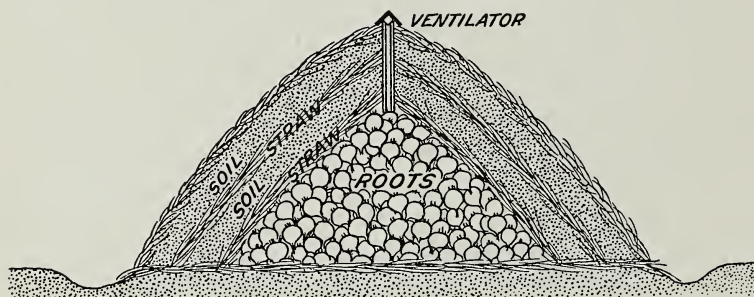
C. L. FITCH

Extension Associate Professor of Truck Gardening, Iowa State University

WITH proper storage space and proper handling, many of the common garden vegetables may be safely stored for winter use. The conserving of the garden vegetables for winter use is important enough during the ordinary years, but this fall this phase of the home garden is drawing more attention than ever before. By saving a quantity of our vegetables for future use, we will be going just that

less a temperature of 40 degrees F. or less can be secured for the most of the storage period it is not wise to try to store many vegetables.

Outside Caves.—These may be built cheaply for more or less temporary use, or may be made of concrete, clay blocks, or brick to last a lifetime. Home caves should have doors at one end only, because with doors at both ends it is almost impossible to avoid



Cross section of an easily constructed pit for roots.

much further toward conserving our nonperishable foods for next season.

Places for Storing Vegetables

House Cellars.—In the home there is no better place for storing vegetables than the cellar of a home which does not contain a furnace. If a place in the cellar can be partitioned off under an unheated room, so much the better. Furnace heated houses can have no suitable place for storing vegetables, except as noted in section 5, unless a special vegetable cellar room or cave can be prepared, well-partitioned off, or better, out-side the foundation walls under a porch or with a roof of its own. No furnace flues or steam or hot water pipes should go thru a vegetable storage. Un-

freezing in severe weather. The cave door should be well fitted and there should be a hatchway or door over the steps leading down to the cave door. A ventilator should be provided in the roof at the back end. A sewer tile with the bell end up makes a very good ventilation flue. A concrete or brick floor, especially in the center, is desirable. In some cases a drain tile is needed to carry off the seepage.

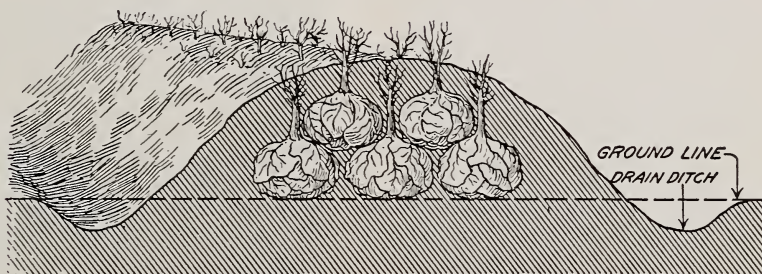
Caves may be entered from the house cellar, or, in many other cases, from the porch. It sometimes is dangerous to open up a small outside cave in cold weather. If entered from the outside the cave should be as near as possible to the kitchen door.

Where used railroad ties or similar material can be secured, a very good cave may be built at small expense as follows: Dig a hole about 5 feet deep, as wide as the length of a tie and as long as desired. Set ties at intervals of 2 feet along the sides like posts. On top of them place ties for a plate; behind them, next to the earth, place boards or brush to hold back the dirt; and on top of the plate put a solid roof of the best ties. Provide a doorway and doors at one end, and cover the top with straw and a sloping roof of earth.

Pits.—These are of two kinds. A,

have very few and gradual freezings and thawings. The box or barrel should be covered first with a piece of burlap or carpet, then with a mouse-proof board cover, and finally with straw or similar material. When taken from the pit the vegetables may be thawed out over night in cold water, after which they often may be kept in ordinary storage for a considerable length of time.

B. Pits for keeping vegetables cold and free from frost are not very reliable unless great care and thoughtfulness be used, but they are cheap and have a useful place where caves or cellars are



Method of storing cabbage on a small scale

those not frost proof; B, those which are frost proof.

A. For vegetables which are not injured by being held in frozen condition during winter, shallow pits, or better, a barrel or box set into the ground, may be used. The earth should be mounded around the box, barrel, or pit to prevent surface water from running in. Vegetables adapted for storing this way are mentioned under sections 2 and 6. They may be harvested after freezing weather begins, stored in convenient piles and covered to protect them from repeated freezing and thawing. They should not be stored until the ground is frozen and then they should be frozen solid and put away in the pit. The idea is to keep them continuously frozen or to

not to be had. It is usual to dig a trench about 2 feet deep, as long as needed and up to 4 feet wide, and in it to place the vegetables in a pointed pile and to cover them with a foot of straw and then with a layer of 6 to 8 inches of earth. It is still better to put on a layer of straw with a light covering of earth, and then later more straw and earth as the weather gets colder. This makes two dead air spaces. At first in the fall the very top is left covered only with the straw to allow ventilation and avoid heating. Later the earth covering is made complete. In severe weather the whole pit and the ground near it may be covered with manure. Those who do not have straw may use instead the strawy manure supply for the next

year's garden, protecting the vegetables by covering them first with newspapers and earth, or they may use leaves or lawn clippings.

Pits are entered by chopping a hole thru the frozen earth at one end, and afterward keeping the hole stuffed and covered most carefully and deeply with straw or old sacks, or both.

Sand boxes in cellars or caves are desirable for certain vegetables. See sections 4 and 6.

Shelves in an upstairs room or in a dry cellar near the furnace are well adapted for the storage of certain vegetables. See section 5.

How to Store Common Vegetables

1. Potatoes are best stored in covered barrels or small bins. In crates or shallow piles they lose too much moisture and shrivel. They must not be stored in piles that are too large, because they heat and may keep poorly or sprout in the center of the pile. No potato should be more than 4 feet from air. Care should be taken to keep earth out of the potatoes, as much of it in any one place in the pile may prevent ventilation and cause heating and rotting. A few potatoes in a cold cellar are far more likely to freeze than those in a large pile.

Potatoes should be kept absolutely dark to prevent greening by light. Freezing destroys potatoes. No potatoes should be purchased for storage that are dug after the ground is crusted with frost, because it has proved impossible to sort out frosted potatoes. All those touched by frost will spoil, one after another. Do not buy potatoes in sacks that show wet places due to a frosted potato.

Potatoes and many other vegetables that require a storage room should not be too dry or too well ventilated. In

some case a damp earth floor or the sprinkling of the floor helps keep vegetables crisp. It is in this respect that pits excel.

2. Cabbage is not injured by moderate frost. Late varieties, perfectly sound and not too ripe, are the only ones fit for storage. To wrap cabbages



Storing Celery

in paper and to leave on the outer leaves helps keep them crisp. For use after Christmas, most cabbage is best stored frozen solid in a pit. It will stand some freezing and thawing. For use after March, cabbage should be stored as kraut.

3. Onions need to be thoroly cured when harvested. Dryness is a first requisite. They should be kept cold as well as dry. A well-cured onion should be firm and not readily dented at the base of the tops by the tip of the thumb, when held in the hand. Onions are best for storage if topped about $1\frac{1}{2}$

inches long. They will stand very little freezing and thawing.

4. Beets, turnips, kohlrabi, winter radishes, carrots, and rutabagas are best stored in sand in cellars or caves, or in pits; or in tightly covered boxes or crocks. The object is to keep them cold and to prevent evaporation. Kohlrabi must be tender when stored.

5. Squashes, sweet potatoes, and pumpkins must be well ripened and cured. They must be free from bruises. They are best kept on shelves in a very dry place. They need not be kept especially cool.

6. Parsnips, parsley, vegetable oyster, and horseradish may be kept in the ground where grown all winter, but as too much freezing and thawing destroys them they should be covered lightly until severe weather and then uncovered to freeze solid and covered again. These vegetables may be stored as suggested in section 4, but the way to have them available all winter and to keep them most crisp is to hold them frozen. The pit method is recommended as best for these vegetables and cabbage.

7. Celery, endive, and head lettuce may be rooted in earth in a cellar or cave, and with occasional watering may be kept until about Christmas time. Turnips, winter radishes, and other vegetables mentioned in sections 4 and 5 may also be stored with the roots planted in sand or earth as above indicated.

8. Garlic should be thoroly cured as onions, or it may be braided by the tops into strings, which are hung up in dry places for curing and storing.

9. Ground cherries or husk tomatoes may be stored for some weeks in the husk in thin layers in a dry place, free from frost.

10. Tomatoes may be kept until about Thanksgiving by bringing the well-matured green tomatoes or the



Tomatoes May Be Stored on the Vines

vines with the tomatoes on, into the cellar or cave in the fall. Most of the tomatoes will ripen and be most acceptable as they color up.

The present household sugar ration—with little chance of increase—is two pounds a month in America, two pounds in England, one and one-half pounds in France, and one pound in Italy

INSECTS AND NEXT YEAR'S WHEAT CROP

T. H. PARKS

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IT is generally conceded that one-tenth of the wheat crop in the United States is annually destroyed by the Hessian fly. Such being the case, Ohio annually contributes nearly three million bushels of wheat to this cause. A recent survey of wheat insects conducted by the Ohio State University, Ohio Agricultural Experiment Station and the State Department of Agriculture gives us valuable information about this and other wheat insects within the state

Hessian Fly

A careful inspection of numbers of wheat fields in 73 counties resulted in Hessian fly being but sparingly found in any locality. Entomologists working in western Ohio found that there is a slight infestation in the western one-third of the state. The highest infestation found for any one county is 4.2 percent. Individual fields were found in other parts of the state where the Hessian fly infestation was greater than this, but the counties visited were so free from Hessian fly that serious danger from this insect seems remote. From this source there is no reason for delayed sowing of wheat in any section of Ohio.

Farmers growing wheat this year lost some of their crop due to three other insects, all of them bearing a criminal record below that of the Hessian fly. These in order of their importance this year were: jointworm, wheatmidge and stemborers.

Jointworm

Jointworms this year caused a heavier loss of wheat in Ohio than all other wheat insects combined. They were pres-

ent in every section of the state and caused much lodging of the straw. This loss was greatest in some of the western and central counties. The jointworm is the larva of a small insect much resembling an ant with wings. The adults move about over the standing straw when the wheat is heading and lay eggs just above the joints in the green stems. The worms which hatch within the stem wall suck the sap and produce small galls or thickened places on the ripening straw. These galls are usually found above the lower joints of the straw, at which point the straw frequently lodges, the head falling to the ground. The majority of the straws remained standing this year even though infested. These galls remain upon the stubble and the jointworms pass the winter there. Some are removed with the straw and are killed passing through the separator cylinder.

In fifteen counties in northeastern Ohio the jointworm above described was absent this year but another form of injury was present which was due to another species of jointworm. These worms made their galls in the sheath just under the head which resulted in greatly enlarging the stem at this point and in stunting the straw which was frequently not over six inches high. On many of such straws no heads developed. This loss in northeastern Ohio was frequently blamed to winter killing by the farmers. It was noticed in that section of the state that late sowed wheat was the most seriously infested, while wheat sowed reasonably early escaped with very little loss. In the absence of Hessian fly this suggests that

the 1919 crop should be sowed a little earlier in that section of the state in order to avoid the injury from the jointworm peculiar to that region.

Insect enemies are now busy destroying the jointworms in their galls in the wheat stubble. These parasites are now racing about over the stubble where they have emerged from the cells of jointworms which they have killed and are laying their eggs on the bodies of healthy jointworms. These insects give us hopes of a possible early control of the jointworm and point to a recession of the outbreak during another year.

Control.—As a precaution against the jointworm it is well to cut infested straw low in order to carry as many as possible to the separator cylinder where the majority are killed in threshing. Plow under the stubble deeply where this ground will be placed in fall or spring grain. This plowing should be done before April 1.

Wheatmidge

Wheatmidge, commonly called "red weevil," was present in wheat heads all over Ohio this season. The orange colored maggots could be rubbed out of the heads at harvest time in almost any field visited. These maggots develop at the sides of the growing kernels where the adult midges (small two-winged flies) deposit their eggs just after the wheat blossoms. The midge larvae develop at the expense of the kernels, many of which they deform and shrivel. Some of the larvae or maggots leave the heads at harvest time and are now in the surface inch of soil. Others remain in the chaff where they are carried to the thresher and come out with the threshed wheat, the chaff, and a few in the straw. These are probably immature and will die before maturing as

they must have green food and cannot live in stored grain or in straw.

Control.—Deep plowing of infested wheat land is the only remedy known. This can be done where the land is to be put to fall or spring crop.

Wheat Stemborers and Bulbworms

These two insects are here classed together as they cause similar injury to the standing wheat. White heads appear in the fields when the wheat is beginning to ripen. This is due to one or the other of these larvae burrowing within the straw just above the top joint. This kills the portion of the straw above the top joint, while the remainder of it remains green. These pests also infest weeds and wild grasses growing along ditch banks and fence rows which accounts for the borders of wheat fields possessing more white heads than farther in the field. One of these borers also injures young corn by boring into the stalk. This larva is peculiarly marked with white stripes down the anterior one-third and the posterior one-half of its body. It is about one inch long when full grown. -

Control.—Destruction of weeds and wild grasses especially along fence rows and ditch banks will reduce the amount of this injury. The loss is not as great as supposed as these larvae do not usually destroy more than 1 or 2 percent of the heads.

Suggestions

Hessian fly is now at a low ebb in Ohio, and as a consequence the program for a record wheat crop in 1919 can be run off promptly and on time.

The eastern two-thirds of Ohio should increase its acreage of wheat and sow promptly on or near the date of maximum wheat production for each

locality. Late sowing should be avoided this year.

Northeastern Ohio should sow a little earlier than usual to avoid wheat jointworm injury peculiar to that region.

Western Ohio should maintain its present acreage and sow at the date of maximum production.

Wheat jointworm will probably do less injury next year than in 1918 because of the presence of parasites of this insect in the stubble where the jointworm will remain until next spring.

Thrifty plants withstand a severe attack of jointworm. Thrifty plants grow in a well-prepared and fertilized seed-bed.

Wheatmidge or "red weevil" may again cause a loss of some wheat in 1919. Deep plowing under of the stubble before April will bury this insect which passed the winter in the soil.

Burning straw piles is not justified by the excuse that it destroys insects.

Destruction of wild grass and weeds along fence-rows prevents the appearance of white heads in wheat due to stemborers and the wheat bulbworm.

The track is clear for a bumper wheat crop in 1919, and there is no reason for decreasing the acreage or delay in seeding due to wheat insects now within the state.

TUBERCULAR HOGS AN ENORMOUS WASTE

M. D. HESLER, '14

Instructor in Animal Husbandry, Iowa State University

AS one stands along the hog dressing rail in any of our large slaughter houses, just after the hogs have been scalded, scraped, and examined by the first inspector, you will notice that almost 20 percent of the hogs are tagged "U. S. Retained." These hogs go into a separate room for further inspection. Here about 2 percent of all the hogs slaughtered are condemned and can be used only for soap grease and fertilizer. Many of the others are partially condemned or passed for sterilization. Ninety-five percent of all hogs condemned are due to tuberculosis and only 5 percent is represented by all other diseases, including cholera.

On July 21, 1917, 182 hogs averaging 272 pounds, were purchased by one of our leading Chicago packers at \$15.40 per hundred pounds, the top price for the day being \$15.50. When they were dressed out, only 24 of them

proved to be entirely free from disease, the rest all had tuberculosis. The packers traced this load of hogs back to a farm in Iowa and from now on until that farm is cleaned up this packer will buy no more hogs fattened there.

While this farmer already had his cash and will not stand this direct loss, he and all other meat and meat product consumers will help to bear this loss by paying higher prices for their products. Not this alone but a diseased condition on any farm is rather an expensive guest, especially with our present prices of feed.

Under the federal inspection law all slaughter houses doing an interstate business must have federal inspection. Many of the tubercular lots are traced back to the owner and the state veterinarian is notified. In most states this officer has the authority to quarantine any farm where he suspects a conta-

gious disease. He generally applies the tuberculin test to the cattle on the farm and looks for any other possible source of infection.

The U. S. government is alive to this waste and is planning to eradicate it where evidences of disease exist. It is therefore important that hog raisers should know the facts about hog tuberculosis and how it may be prevented. The suppression of this disease would

of tuberculous cattle. This has been proved by the fact that in instances where a marked increase in the number of tuberculous hogs from a certain locality has been noticed and investigated, it was generally found that the hogs had received unpasteurized skim-milk or had followed cattle which were infected. Tests have shown that when hogs were fed on tuberculous milk for only three days with a post-mortem ex-



A Tubercular Cow Will Infect Many Hogs

save the country many millions of dollars annually.

Methods of Infection

The farmer himself is largely responsible for the diseased condition of his hogs. Feeding under filthy conditions often causes minor diseases, which in turn lower the vitality and increase the chances for infection with tuberculosis. This infection most frequently takes place thru the digestive tract.

Two factors which produce the majority of cases of hog tuberculosis are unquestionably the milk and droppings

amination held 170 days later that 83.3 percent of the hogs had contracted tuberculosis.

We also find the same conditions existing where hogs follow infected cattle. With healthy cattle this manner of feeding is to be commended because of the economy, but when the cattle have tuberculosis they are almost sure to pass it on to the hogs.

Of 34 hogs which were marketed in one lot, 23 were found to be diseased, and upon investigation it was found that the owner had a herd of dairy

cows, the stable manure from which was thrown into the yard. The hogs were given no milk and were not allowed to mingle with the cattle, but were pastured, fed some corn, and were allowed to pick over the droppings from this herd of cows. Nineteen of the twenty-seven cows in this herd were found by means of the tuberculin test to be tubercular and this test was verified when the cattle were slaughtered a little while later.

Another method of infection is by means of diseased carcasses. Many farmers allow their hogs to eat the carcasses of animals which die from various diseases, especially those of hogs and poultry.

Another dangerous source of infection is among the small country slaughter houses, where quite frequently we find that the only method of disposal of the blood, intestines, viscera, and other inedible parts is by feeding them uncooked to hogs, a herd of which is usually kept on the premises.

Hogs may also become infected thru tuberculous attendants by eating their sputum. We also find that tuberculosis may be transmitted from hog to hog, especially from a tubercular sow to her pigs.

Methods of Prevention

Since the infection of hogs may be traced to cattle in the majority of cases it behooves us to clean up the herds of cattle as well as the hogs. One of the first steps to be taken in preventing the further spread of tuberculosis is to remove all affected animals, whether hogs or cattle. In dealing with cattle it is best to apply the tuberculin test to the entire herd and pick out the affected animals, but with hogs the surest method can be found in the slaughter of the entire drove as soon as they can be

put in a marketable condition. They should be slaughtered at an abattoir under federal inspection.

With the tubercular cattle and all hogs removed from the place, the next step should be the disinfection of pens and houses. Clean them thoroly and cover with a coating of lime wash containing 4 to 5 ounces of compound solution of cresol (U. S. P.) to each gallon of lime wash.

The yards should also be carefully cleaned and sprinkled with lime. With the premises cleaned up, healthy stock may be procured and with proper care and feeding the owner may feel reasonably sure of keeping a clean drove of hogs.

Be sure to keep all cattle on the farm tuberculin tested. Never use milk from a public creamery unless it has been heated to 145° F. for 30 minutes or to 176° F. for a moment. All offal or garbage should be thoroly cooked. Never allow the hogs to devour a diseased carcass of any kind.

The very fact that a farmer generally uses some of his hogs for his own meat should be incentive enough to clean up the place, let alone the loss of feeding high priced feed to hogs which are diseased and which make expensive gains and which raise the price of pork by going to the grease tank instead of the butcher's block.

Dr. John R. Mohler, assistant chief in the U. S. Bureau of Animal Industry, says:

"Sooner or later the packer and slaughterer are going to buy hogs subject to the post-mortem inspection—and the hog raiser who continues to fatten his hogs with tuberculous material should be made to sustain the losses arising from his lack of knowledge, skepticism, or indifference.

STARTING THE 1919 WHEAT CROP

PROF. C. J. WILLARD

Department of Farm Crops, Ohio State University

SIXTY million bushels of wheat for 1919! Such is Ohio's quota, if we are to do our share in feeding our Allies and our boys at the front in 1919. Can we do it? There is only one answer possible.

To produce this much wheat in Ohio in 1919 will require both more acres, and more wheat per acre. The question of increased acreage should be

quire more than an average yield per acre to fill our portion of the world's bread basket. The ten-year average yield per acre in Ohio is 16.6 bushels. We must raise that materially next year, and it should be easily possible to do so.

Means Increasing Production

There are four general methods of increasing the yield per acre:



A High Yielding Wheat Field

considered by every patriotic farmer and farmers' organization. Every possible acre should be put into wheat this fall. It is particularly unfortunate that at the time this is written, the price of 1919 wheat is fixed at such a point that the profit of growing wheat instead of other cereals is very questionable, and this will make against any great increase in the acreage. However, we should put in the wheat, and work unremittingly for a just price.

But after all the acres which can be planted to wheat are put in, it will re-

1. Fertilizers.
2. Selection of better varieties.
3. Seed treatment.
4. Better preparation and planting.

Fertilization is the most direct and essential method of increasing crop yields. No amount of care in other ways can do very much toward atoning for an infertile soil, while a really fertile soil will produce good crops in spite of much careless treatment.

The wheat crop is probably the first one for which farmers in this state buy fertilizers. Wheat is a cash crop, and

makes a quick and profitable return for proper fertilization.

There is no question as to what element should be applied for wheat. Phosphorus is the one element whose purchase at present prices is profitable, and the return from phosphorus are certain and manyfold. At the Ohio Station, 160 pounds of acid phosphate increased the yield of wheat 6 bushels per acre in a potato, wheat, and clover rotation, as a 19-year average. In a corn, wheat, and clover rotation, which was treated with 8 tons of stall manure per acre, each rotation, the addition of 320 pounds of acid phosphate per rotation increased the yield of wheat $5\frac{1}{2}$ bushels over the yield with manure alone, besides giving large increases in the other crops.

The Illinois Station last year reports as an average of results from ten experiment fields in Southern Illinois, the yield of wheat on untreated land as 7.9 bushels, while the average yield where the soil had received ground limestone and raw rock phosphate was 29.7 bushels. Eight bushels from the land itself and over 20 bushels from the treatment applied.

Even this record was exceeded by the Ohio Station at the Mahoning county farm last year. Three plats treated with 200 pounds of acid phosphate made respectively 20.3, 24.5, and 24.9 bushels more than the unfertilized land alongside.

A hundred such figures could be given, all teaching the same lesson: *phosphorus pays*. Under the conditions most common in this state, acid phosphate is usually the most immediately profitable form in which to apply it, but any form of phosphate fertilizer is preferable to ready-mixed complete fertilizers. Both nitrogen and potas-

sium are too expensive to buy for use on wheat, or any other common farm crop. There is potassium enough in the soil, if it is liberated by a *good system of farming*, to supply us indefinitely. A good system must, however, supply the nitrogen used, either in manure or by plowing under legume crops.

Value of Limestone

Limestone, however, gives profitable returns on wheat. It is not so essential to wheat as to clover and alfalfa, but on acid soils the increase in the wheat crop from its use will usually pay for the lime used in the rotation.

After the soil has been made fertile, probably the choice of a variety is next in importance. Varieties differ widely in yield, as everyone knows. The Ohio Station has been testing old varieties and developing new ones thruout its 30 years of service, and their results should be considered in choosing the variety to grow. There are far too many varieties, and there is far too much "just wheat" grown in the state at the present time.

The great advantage in using the best variety is that, aside from the initial cost of the seed, any gain is all net. Increased yields from fertilizer or from better culture cost a good deal, but the gain from using better varieties costs nothing but the securing of the variety. So even if the advantage is only 2 to 4 bushels, it is very much worth having. And a good variety, once secured, does not "run out" except by careless mixing in threshing and otherwise. If kept pure it will be as good 20 years from now as today.

Movement to Standarize Wheat

A movement is being started to standardize our varieties of wheat by concentrating on the best varieties in the state. Three varieties created by

the Ohio Station are leading their parent varieties and most others by a good margin. These are Portage, Gladden, and Trumbull, pure line selections from Poole, Gypsy, and Fultz respectively. They have consistently outyielded their parent varieties, which are themselves standard, high-yielding good varieties, by from 2 to 4 bushels per acre.

Portage has led all red wheats at Wooster, as a ten-year average. It is a smooth wheat of good milling quality, perhaps a little deficient in stiffness of

yielding red wheat at Wooster, and Valley, another old reliable sort. The records of these eight varieties as an average of the last ten years is as follows:

	BU. PER ACRE
Portage	39.7
Gladden	39.0
Trumbull	38.3
Poole	36.7
Nigger	36.4
Fultz	36.0
Valley	36.0

There are other varieties as good as



Few Crops Are More Sensitive Than Wheat to Careful Preparation of the Soil

straw and susceptibility to loose smut.

Gladden has been the greatest state-wide success among the new sorts. It is a bearded, stiff strawed red wheat, which has not ranked lower than second at any county experiment farm for which averages are available.

Beside the six varieties mentioned above, at least two other varieties seem worthy of mention, Nigger, which as an 18-year average was the highest-

some of these, but none appear to be better at the present time, and there is certainly all the choice needed to suit anyone, in these varieties. Certain white wheats, of which Dawson's Golden Chaff is the best, are also very good yielders, but they are so lacking in milling and market value that they should not be sown.

In this connection it is worth while to sound a warning against buying the

"Miracle" or "Marvelous," new varieties sometimes advertised. One can lose little and will usually gain much, by waiting till they are tested out.

Methods of Smut Control

There has been a considerable amount of stinking smut in the wheat over the state this year. This causes a loss to the farmer both in yield and in price, "smutty" wheat selling at a considerable discount. This loss is needless, as it can be almost entirely prevented by treating the seed with formaldehyde. All seed which is in the least "smutty" should be treated before sowing.

Two methods are in use, either soaking or sprinkling. The solution is the same in either case, one pound of 40 percent formalin to 40 gallons of water. For the soaking method, the grain is dumped into a tub or tank of the solution, stirred well, and all floating "smut balls," etc., skimmed off. The seed is left about ten minutes, and then the solution is drawn off and the seed spread out to dry.

In the sprinkling method, the solution is applied to the grain on a tight floor with an ordinary sprinkling can, shoveling the seed over thoroly, and using $\frac{1}{2}$ to 1 gallon of solution per bushel of seed. After mixing, the seed should stand covered in a pile for one or two hours, then spread out to dry. This method is not as good for wheat as the soaking, because it does not get rid of the "smut balls." Wheat to be treated by the sprinkling process should be very carefully fanned first.

After treatment, care should be taken not to reinfest the seed from dirty sacks, bins or machinery. This treatment will not affect loose smut. The only remedy for that, the hot water treatment, is too difficult to use

on the seed for large acreages. If loose smut has been serious, and it is desired to keep that stock of seed, enough can be treated to sow a seed patch for the next year. In this way seed uninfected with loose smut can be secured, and as this smut spreads very slowly, the treatment need not be repeated for some time.

Cultural Methods Important

The wheat yield can also be increased by proper cultural methods. Few crops are more sensitive than wheat to careless, improper preparation of the soil. At the Kansas Station yields of wheat on the same land varied 9 to 35 bushels per acre, simply with different methods of preparation. The wheat seedbed should be firm, well compacted, with plenty of stored moisture. If the land is to be plowed it should be done as early as possible, and at least three weeks before seeding time. The land should then be well worked until the wheat is sown. If the land must be prepared and planted at once, it is sometimes preferable to disk the land thoroly rather than plow, especially when following soybeans or other cultivated crops.

The best method of seeding, viz., with a grain drill, is now almost universal. Drilled wheat winterkills less, requires less seed, and yields more than that sown broadcast. Recently great claims have been made for drills which sow in rows four inches apart, but experiment has not supported the claims.

The time to sow for maximum yield ranges from September 10 in the extreme northern part of the state to October 5 in the extreme south, about one week later for every 75 miles south.

Within a wide range, the rate of seeding does not greatly affect the yield. The standard rate for this state

is 6 to 8 pecks, the higher amount being a little surer. If for any reason seeding is delayed later than the most favorable time, more seed should be used. The late sown wheat does not have time to stool out like early sown, and thicker seeding will partly make up for this.

Such are the more important ways of increasing the wheat crop on the same acreage. If every farmer in the state were to secure the yield that our best farmers continually get by using these methods, the wheat crop would be more than doubled.

WINTER INJURY TO FRUIT TREES

PROF. WENDELL PADDOCK

Department of Horticulture, Ohio State University

The winter of 1917-1918 will long be remembered by many fruit growers not alone because of the disastrous effects, but because of the unusual injuries as well.

All experienced fruit growers expect a certain amount of winter-killing in peach orchards when the temperature

tricts the mortality among the peach trees that are over six years old has been very high. On the other hand, the younger trees, where given good care, have come thru the ordeal in good condition.

A most unusual conditon, and one that the writer has never seen or heard



Orchards on an Elevation Are Not So Subject to Winter Injury

falls to 15° below zero, and they know that each degree below that point enhances the danger. It is not surprising, then, to learn that in some of our more important peach-growing dis-

tricts of before, is the presence of numerous live fruit buds on wood that has been killed by the cold. In the latter part of June it was very common to see several peaches of normal size attached to twigs

that had not put forth a leaf, and of course never would. Such branches are doomed, of course, and many of the trees as well. It is a matter of common knowledge that the fruit buds of the peach are easily winter-killed, but the results of last winter show that exceptions may occur.

Considerable interest is now being taken in the statement that was made years ago to the effect that the fruit buds of the peach can scarcely be too immature if they are to pass thru a severe winter without much injury. But the question arises, how is one to secure immature fruit buds on well-matured wood? It is well nown that only well-ripened wood of any kind can withstand severe freezing.

But the peach trees were not the only kinds that suffered. Many cherry, plum, pear, and apple trees were severely injured, and some were killed outright, particularly the older trees. Some of the stricken cherry and plum trees came into full leaf only to shrivel

and die at midsummer—much to the mystification of the owners.

Another peculiar form of winter injury that the writer had never seen before was the formation of frost cankers in the crotches of apple trees. In one orchard near Coumbus 60 acres of seven-year old apple trees, 500 trees were injured and about 100 were so badly affected that they will die. In this case an irregular area of bark was killed in the crotches of the trees, starting in the center and radiating in various directions. In cases where the main limbs are nearly girdled they are certain to die, and thus the trees will be ruined. Such injuries probably occur where ice forms in the crotches, followed by severe freezing weather.

Fortunately winters like the one just passed are of rare occurrence so we may face the future with confidence. The experienced orchardist will repair his damaged orchard and, profiting by this experience, will replant with hardier varieties, and those that are best adapted to market needs.

BUILDING UP A PUREBRED HERD

G. W. KREITLER, '20

THE chief difficulty with the average breeder who wishes to build up a herd of high producing dairy cattle is the lack of capital. Add to this the inexperience of a young man who is just starting in the livestock game and the vast uncertainties of dealing with livestock, and it is seen that the new breeder will have great obstacles to overcome.

Assuming that he has already chosen the breed best adapted to his needs, and that he has a nucleus of grade cattle upon which to work, the only thing for any breeder of any kind of livestock

to do is to work into purebred stock. Here is where the lack of capital will make itself manifest. A good method to follow is to secure a purebred sire of some well-known and long established line of breeding. It is desirable that, if possible, a sire be chosen that has already proved his worth. However, the price of such a sire is often prohibitive, and the only thing that is left to do is to purchase one of his sons from a high producing dam. This sire can be used to good advantage in grading up the herd that is already established.

A satisfactory sire secured, the next

step is to find a few registered females with which to mate him. Here again it is cheaper to buy heifer calves and raise them to maturity than it is to buy mature cows. The heifers should be well bred and from tested dams with good records. Altho the sire is truly more than half the herd, and should be chosen with the utmost care, it must be remembered that without high class females with which to mate a bull, his off-

honesty, only the purebreds should be kept.

The selection of animals for a foundation herd is much simplified by the present system of making official tests of production. While these tests should be carefully followed in selecting the herd, one must not neglect the form and conformation of the animal that he is to purchase. Good bodily strength and constitutional vigor should be



RAISE YOUR OWN COWS

spring will not be a credit to either the sire or the judgment of the breeder.

With a nucleus of a good sire and a few purebred calves, it only requires time and good luck to round out the nucleus into a neat little herd of purebred cattle. As time goes on and the offspring reach the age of maturity, it will become necessary to purchase a new sire.

As the number of purebreds in the herd increase, the grades should be sold. A great many cases have been known where the breeder who keeps both grade and purebred stuff has substituted a grade calf for a purebred. In order to remove all doubt as to the breeder's

sought in all animals, whether in purchasing or in choosing those to remain in the herd.

The big advantage in keeping purebreds over keeping grades is the higher price that is obtained for the surplus stock. Only those breeders with a reputation will be able to demand and to get a high price, even for the registered stock. One of the easiest and quickest ways to gain a reputation is to test the cattle officially for production. But it is only by years of consistent breeding and testing of his herd that the dairyman will build up a reputation that will bring breeders from far and wide to his herd for their foundation stock.



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ACKNOWLEDGMENT

"The Student" like other publications has been seriously crippled thru enlistments. In fact a month before the publication of this issue the editor was called to the colors which made the problem of getting out this number of "The Student" a serious one. It was only with the generous help of Mr. Frank C. Dean, of the agricultural college extension service, and the hearty response with articles by the contributors, that this issue was made possible.

TWENTY-FIVE YEARS OLD

Twenty-five years ago this issue, "The Student" was founded with Charles W. Burkett as editor and Franklin P. Stump as business manager. From an issue of fourteen pages at that time, "The Student" steadily grew larger until it attained its present day size of sixty-four pages. At the

time of the first issue there were only seventy-six agricultural students enrolled of which one-half of these were more or less connected with "The Student." From such a hearty support as this, nothing but success could result. The first editorial reads, "Another board of editors launch their frail and untried bark on the sea of journalism." The sea was pretty rough at times but the bark turned out to be a strong and aggressive enterprise which could not be downed. From a few readers in 1895, the circulation of "The Student" has grown until today it is read all over the state of Ohio by farmers, alumni, and students.

Let us hope that in another twenty-five years we shall still be reading "The Student," not the same "Student," but a bigger, more widely circulated "Student" that has kept pace with the development of agriculture.

MATURE CORN FOR SILAGE

There seems to be a great difference of opinion among certain farmers as to the proper stage to cut corn for the silo. Last year when there was so much frosted corn, it was ensiled as soon as possible, disregarding the maturity of the plant. That well-matured corn makes the sweetest silage, besides containing the greatest amount of digestible nutrients, is a fact well appreciated by most farmers. When cut at maturity, corn contains the maximum amount of sugar. In fact, the sugar keeps increasing as the corn plant reaches the final stages of growth. When ensiled, the bacteria, after taking all the oxygen that percolated the mass while being ensiled, take the oxygen from the sugar in the corn to make lactic acid. Only a certain amount of lactic acid can be formed when the action of the bacteria and enzymes (substances which also aid in breaking down the sugar into lactic acid) is destroyed. Hence, when there is a large amount of sugar present, there will still be some left after all the acid is formed, giving the characteristic sweet taste to mature corn silage. Green corn makes sour silage, due to the fact that all the sugar is acted on to form lactic acid and none remains to give a sweet taste to the silage.

MORE WHEAT

Much has been and is being said about increasing Ohio's wheat yield to sixty million bushels in 1919. Each farmer must study that statement himself and realize that it includes himself, if we are to make good this slogan. If his yield of wheat has been low and he has not fertilized or limed his land, then the responsibility of whether sixty million bushels are obtained in 1919

rests in a large part on this class of farmers. It has been abundantly proven that the average acre yield of wheat in Ohio can be doubled with proper culture and fertilization. The problem is to get the farmer who is only averaging ten to fifteen bushels of wheat per acre to change his methods so that an increased production can be obtained. The articles in the farm press on how to raise large wheat crops are not meant to impress the man who is raising wheat crops that are averaging thirty, thirty-five, or forty bushels to the acre, but the man who has been content with a very low yield.

The progressive farmers of a community should impress these slackers with the value of proper fertilization. Not only would the increased yield aid the country but the farmer would obtain a greater profit. Let us concentrate our efforts on these farmers with low averages.

OUR ADVERTISERS

Get acquainted with our advertisers and convince yourself of the reliability of the firms and farmers backing them. Consider the quality of the products they offer you. They realize that this magazine is read by the best class of farmers and students, and are therefore glad to advertise the best that can be had. When you do business with them you can feel sure that you will get a square deal, as "The Student" stands back of its advertisers.

Students, patronize our local advertisers. They are deserving of your trade. When you go into a store just mention "The Student" and say a word or two about their ad. It not only assures you of better service but shows that this magazine is of real value to its advertisers.

THE STATE FAIR.

Are you going to the Ohio State Fair, August 26-30? Every farmer interested in the improvements and latest ideas relative to agriculture and desirous of improving his own condition should be there to revel in its educational features. Not only will he go away with the feeling that many of his problems have been solved but he will be filled with a higher purpose as a result of his contact with men who are leaders in farm life.

CORN CRIBS

Many farmers will expend a great deal of time and labor this fall harvesting their corn, and then place it in an old fashioned wooden crib. The inevitable result is an enormous waste of grain. If a farmer using this method of storage could find out his loss in grain for the last ten years on account of rats and other rodents besides loss from spoiling, he would realize what this waste amounts to. It would probably have furnished him with sufficient capital to buy a ratproof crib, and still have some money left. A metal crib is one of the most satisfactory means of

combating the rat menace, besides making an attractive improvement on the farm. There are many types of ratproof corn cribs which are all more or less satisfactory. An investment of this kind is cheap insurance for saving the much-needed grain.

Owing to lack of markets for their corn, farmers in Argentina, South America, are in some cases disposing of it for fuel at 40 cents per bushel.

Almost 70 percent of all the sugar consumed in this country is used in the households. So it is up to the women to make the sugar go around.

The maximum price of milk in Rome has been fixed at 18 cents per quart. In 1914 the price was from seven to eight cents per quart.

In 1917 about 100,000 truckloads of hay and straw were secured by Germans in occupied portions of France and Belgium.

Think not only of the sugar you save but of the good you do by saving.

Home Economics Department

SUGGESTIONS FOR KEEPING BUDGETS

GRACE R. LIENHARD, '18

THE keeping of household accounts is not a new branch of household management, but it is becoming more and more to be considered a necessity. Housekeepers are beginning to realize that if their families are to have fewer unsatisfied wants, they must know what they are spending their money for, and just how they can spend their money to get the maximum value out of every dollar. Money has been more plentiful, but with the increase of income there has been an equal increase in prices of food, clothing and shelter.

Why keep a system of budgets? These are some of the advantages:

(1) An accurate knowledge of the use of the family income; (2) A check on wasteful expenditure; (3) An encouragement to form a proper relationship between the various classes of expenditures; (4) An encouragement to save; (5) A protection against paying a bill twice; (6) A settlement of disputes.

There are many ways of keeping these household accounts, but anyone who is interested can work out a system that will best suit the family's need. Much depends upon the manner of keeping account of the spending, whether one person has charge of it all and finds out from each member of the family just what was spent that day, or whether the income is divided among the members of the family, and each one is held accountable for his share and a report made at the end of each month.

If one person has charge of it all,

there is the card catalog, but this is not satisfactory because the card system requires the items to be spread out over such a great space that it really is hard to get a complete, concise statement at any desired moment.

Then there is the daybook system, in which the members of the family jot down the expenditures of each day. At the end of each month one member goes thru the daybook and classifies the items, then transfers the whole into a ledger. This method involves a great deal more time, but is much more satisfactory than the card system.

The system which requires the least time and is found very satisfactory; is the one in which every day's expenditures are accounted for and each day then is finished. In this method the book is divided according to the family's needs, space left for thirty-one days, and a few lines for balancing at end of the month. Then there should be a few pages for the totals for the whole year. Such a method proves very satisfactory because each housewife can make her subdivisions as she deems best for her needs.

The most important part of budget keeping is the division of income. It is very hard to make a statement about the division of income. There are five general divisions into which the income might be divided, and then these are subdivided. The divisions are food, clothing, shelter, operating expenses, and higher life.

Let us take an income of \$2000 and try to divide it. First of all, it is im-

portant that the family have sufficient and the right kind of food. About 25 percent should be spent for food, and it is well to divide this item into different groups, in order to know whether the family is receiving the right kind of food, and that the right proportion is given to each.

Foods

Meat	Green Vegetables
Butter and Eggs	Fruit
Milk	Groceries

Under the head of groceries is placed all starchy food, as potatoes, rice, and other general groceries.

Next comes clothing, and as a rule about 15 percent is spent for clothing. This item should be divided according to the number in the family and then each have his own column, hence showing exactly what each has received.

Then shelter; if the home is owned there will be different items than if the home is rented. About 20 percent goes for rent. Under the owned home comes the items of taxes, insurance, water rent, and depreciation and repair.

Operating expenses take about 15 percent, and under this head comes fuel, light, household repairs, and supplies such as soap, brushes, brooms, paper, etc.

Last of all comes higher life and incidentals. By this we mean the other things that come into our lives, such as education, travel, domestic service, medical and dental service, drugs and toilet articles, club fees and dues, church and charity, entertainment, life insurance premium, investments and savings, and unaccounted for. This would take the remainder, or 25 percent.

Clothing remains about constant at 15 percent, but with increase of income the percentage spent for food decreases,

and more is spent for higher life. If at all possible, the percentage for higher life should increase and the other four should decrease accordingly.

Last of all, the accounts must be balanced. The expenditures must equal the income, altho some months the expenditures will be more than the income, but the whole year must balance.

By keeping close account and then studying the accounts from year to year, the housewife is able to tell where she could have saved, and spent to better advantage, thus being better able to give her family the best on the given income.

SAUCE FOR YOUR MEAT

In the midst of the steaming and aching of canning and drying let's pause a while to pile high the old-fashioned fruit stand with rosy peaches, purple plums, and pendant grapes. Place it on the hall table or sideboard where family and friends may feast on its loveliness of color and form and the rich perfume of these summer fruits.

And, busy housekeepers, while storing for winter enjoy the fruits in season—serve them fresh or serve them cooked, serve them hot or serve them cold—let fruit be part of every meal as a dessert or as a salad, and above all as a sauce for meat.

"Certainly," said Squire Hardcastle, "there is no better relish for game, mutton, lamb, fowls of every sort, even roast pork, than *pruin* sauce." To the Squire's blue plums let's add apples and peaches, served piping hot as an accompaniment for meat; and soft, ripe peaches, fresh and unsweetened make an excellent summer partner for bacon and salt fish.

If you are not accustomed to fruit served hot, try it. The taste for it is

worth acquiring. Don't destroy the natural flavor by sugar and spice or overcooking. Treat fruit with the same respect you would a potato—that is, cook it just tender thru and serve it hot. Cooked in this way the real fruit juices and flavors are retained. Some fruits need no sugar at all and others merely a suggestion. Educate the family to demand fruit acids as an accompaniment of meat to replace part of the starch usually consumed. Fruit is food; teach the family to enjoy it by serving it well, and better health will repay your good cooking.

With Bacon.—With crisp bacon serve apples, piping hot and bursting with juice, baked without sugar. Or cut the apples from the core without peeling, place in a deep pan with a *very* light sprinkling of sugar and half a cup water. Cover and steam until tender; remove cover, sprinkle top with brown sugar or brush with syrup and brown in hot oven. Serve from dish sizzling hot.

With Roast or Steak.—Ripe peaches or pears steamed until just tender thru make an appetizing sauce for meats. Peel but do not cut. Cook in a saucepan, tightly covered, with just enough water to prevent burning. Allow one tablespoon of sugar to a dozen peaches or pears. Steam until tender and serve hot. Be careful not to overcook.

With Chicken.—Blue plums are especially good with chicken. Add a very little sugar and little or no water. Heat slowly to prevent burning and cook until plums are broken. Serve hot. Peaches or apples quartered and cooked clear in a syrup of water, sugar, and bit of lemon make a delicious accom-

paniment for chicken. Serve rice with this combination.

GRANGE BANS NEEDLESS REFRESHMENTS

The proverbial "groaning tables" at farmers' gatherings for between-meal eating are to be outlawed as unpatriotic, judging from sentiment recorded in the recent resolutions of Mallet Creek Grange in Medina county, Ohio. This Grange has resolved that,

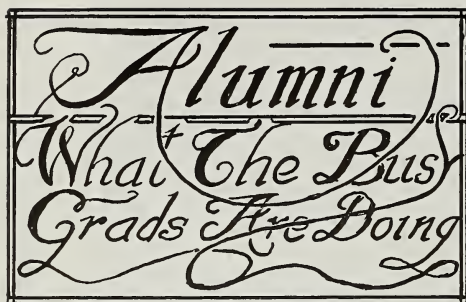
"WHEREAS, Each and every housewife is comanded to conserve all food-stuffs;

Resolved, That the matrons of said Grange refuse to prepare bread, cake, pickles, meatsauce, chow chow and other kinds of chow for the consumption of patrons of the Grange during the months from June to October, inclusive, unless such food can be served at a time to take the place of a regular meal."

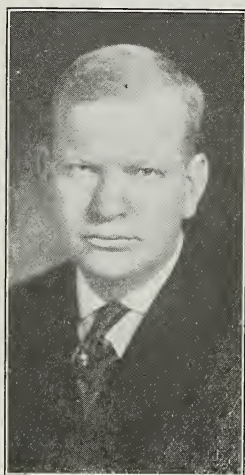
POULTRY TOUR CLOSES

The poultry and food truck of the College of Agriculture which has been touring the western half of Ohio since June 1 will be returned to the University the latter part of August. Altho the season has been considered rather unfavorable on account of the inability of farmers and poultry raisers to be present, the average attendance at the demonstrations has been over 75.

Talks and demonstrations regarding poultry were given by F. S. Jacoby and M. C. Kilpatrick, and a canning demonstration followed by a talk on food conservation was given by Miss Lena Bumpas. Since July 13, Miss Maybelle Cornell has been conducting the food work.



Thomas L. Wheeler, now managing editor of *The Indiana Farmers' Guide*,



entered Ohio State in 1899, registering in the college of agriculture. His journalistic career began with various positions on *The Lantern* from reporter to managing editor; he was also an associate editor of *The Agricultural Student*.

Wheeler entered the government's service in soil survey work in 1904 but returned nine months later to complete his duties in the college of agriculture. He was a graduate in 1905.

In the spring of 1905 he married Anne Batterson of Columbus, a graduate of the home economics department in 1904. Wheeler accepted a position with the *Chicago Daily Drovers' Journal* as agricultural editor at this time and remained with the publication until August, 1908, when he became associate editor of *The Farmers' Guide* at Huntington, Indiana. In the spring of 1911 he returned to the University as editor in the Agricultural Extension

department. After two years of this work he went back to *The Farmers' Guide*. In December, 1917, the publication took over the interests of *The Indiana Farmer* and the two papers now appear under one publication, *The Indiana Farmers' Guide*. The new paper has a weekly circulation of 140,000.

C. R. Arnold, ex-'19, who was to have been editor of *The Agricultural Student* this year, has been called into service. He is in the 33rd Company, 9th Battalion at the Syracuse Recruit Camp, Syracuse, N. Y.

Howard Rogers, '14, was appointed county agent in Lorain county, effective August 1, to fill the vacancy caused by the resignation of A. W. Hayes. Mr. Rogers was born on a farm in Putnam county. Following his graduation he managed the home farm and later the prison farm at London. During the past two years he has been teaching at the Bluefield and the Beckley (W. Va.) High schools. During the past summer he has been assisting the county agent in Raleigh county, West Virginia.

The *Marietta Times* of July 19 says that E. J. Riggs, '95, of Raccoon Island, former county agent of Washington county, anticipates an apple crop of 5000 barrels, and has 120 acres in corn. This spring Mr. Riggs disposed of \$6000 worth of cattle and hogs fed on his farms.

L. L. Rummell, '15, who was formerly editor of publications at the Ohio Experiment Station at Wooster, and a former editor of *The Agricultural Student*, has been appointed associate editor of the *Ohio Farmer*.

William T. Magruder, Jr., '15, who was until recently managing the hog department on Circle W farm at Gates

Mill, has accepted the position of dairy commissioner for the state of Tennessee.

Harry Solether, '17, has enlisted in the Ensign's school. Up to that time he operated a large farm at Jerry City with his brother Clell Solether, '15.

Carl Eichorn, '15, is in charge of the poultry department on Circle W farm at Gates Mill. At the present time he is keeping over four thousand chickens.

Clarence M. Baker, '16, taught the agricultural journalism courses at the Ohio State University until recently, when he became editor of publications at the Ohio Experiment Station.

William C. Mills, '98, M. Sc. '02, curator and librarian of the Ohio State Archeological and Historical Society, has volume two of "Certain Mounds and Village Sites in Ohio" now ready. The volume contains the official reports of four seasons' field exploration in the prehistoric sites of Ohio as follows: Explorations of the Seip mound; archaeological remains in Jackson county; exploration of the Tremper mound, and explorations of the Westenhaver mound.

Orville A. Jamison, '12, formerly a member of the faculties of Michigan and the Maine state agricultural colleges, is now professor of dairying at the Massachusetts Agricultural College, Amherst.

Frederick H. Herzer, '14, is connected with the department of animal husbandry at the State College of Agriculture, Fayetteville, Arkansas.

Ralph Q. Smith, '14, is county agent of Allegany county, New York, with headquarters at Belmont. He is also county manager of the Allegany Farm Bureau Association.

Siragan H. Ezekielan, '14, is connected with the biological department

of the Eli Lilly Company, of Indianapolis, and has his office at Greenfield, Indiana.

Fred E. Perry, '14, is manager of the Evergreen Farm at Leipsic. Mr. Perry was recently elected president of Putnam County Ohio State University Association.

Dillon S. Myer, '14, is now connected with Purdue University, Lafayette, Indiana.

Sanford G. Price, ex-'19, is attending the officers' training camp at Camp Sherman.

Robert Wylie, '15, formerly at Iowa State College, Ames, is to be head of a department at the South Dakota State College of Agriculture, Brookings, next year.

Russell R. Pearson, '16, formerly professor of agriculture at Bethany College, West Virginia, has given up the teaching profession for farming.

Melvin E. Wyant, '18, and Pauline Atcheson, '17, were married on the afternoon of commencement at the home of the bride in Linden. Dr. Thompson officiating. Mr. Wyant is in the army and left soon after the wedding for Camp Taylor, Kentucky.

Luman Tyler, '17, and Miss Stacie Fowble, of West Manchester, were married May 23. They will live on Mr. Tyler's farm near New Paris.

Tom White, '15, is in charge of the horticultural department on Circle W farm at Gates Mill.

Marion V. Bailey, '18, business manager of the *Agricultural Student* last year, is in the O. T. S. of the Tank Corps at Camp Colt, Pa.

Carl Nims, '11, is dairy herdsman on the farm of Ralph King at Mentor, Ohio.

B. L. West, '06, at one time business

manager of *The Lantern*, is advertising manager for the Cussins & Fearn Co. at Columbus.

Glenn Hayes, '12, now managing editor of *Better Farming*, Chicago, was business manager of *The Agricultural Student* when Guard was editor. Likewise he went to Chicago soon after graduation, where he became interested in the business end of several farm publications. Later he became editor of *American Farming*; in 1916 he became managing editor of *Better Farming*, a monthly paper with 347,000 circulation.

HAVE YOU RENEWED

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Subscription
Yet?

DO IT NOW.

ALUMNI AS TEACHERS

The following list contains the names of the alumni who are preparing to teach under the Smith-Hughes act this fall, and the names of the schools where they will teach: Greenspring, L. D. Mennell, '16; Edison, L. N. Geiger, '18; Bloomville, M. L. Jordan, '18; West Lafayette, R. W. Wells, '16; Milford, J. C. Spence, '18; Gallipolis, R. E. Crouch, '16; Lancaster, Geo. L. Schuster, '16; Bellefontaine, W. T. Ryan, '14; Medina, A. C. Kennedy, '15; Wadsworth Tp., R. B. Simon, '12; Wheelersburg, Fred R. Keeler, '18; Hillsboro, Thos. E. Berry, '18; Prairie Depot, G. K. Sivaslian, '14; Millersburg, George H. Krill, '18; Chagrin Falls, E. W. Budd, '17; Versailles, H. W. Nisonger, '14; Vaughnsville, E. J.

Grener, '18; Ashley, E. O. Bolender, '16; Olmsted Falls, Rollin E. Steen, '16; Fayette, L. J. Smith, '17; Pleasant Tp., E. B. Hawes, '13; Hebron, F. H. Smith, '16; New Vienna, W. F. Bruce, '11; Hilliards, F. H. McMillen, '17; McConnelsville, S. L. Ruddell, '12.

GREASE THE TRACTOR

A great number of the breakdowns with tractors can be traced directly to a deficiency in lubrication or greasing. If directions that come with tractors are followed explicitly, little trouble will occur. But if one goes to the field to do a piece of work that is hard on the tractor, and neglects to turn down certain grease cups as often as directed, then the time comes when he regrets his negligence. I know of one case where the operator neglected to see if all the lubricating pipes in a vacuum feed system were supplying oil properly. One of the pipes supplying the cylinder had become clogged, and he had not noticed it; in a short time the piston cracked. This accident held up the operation of the tractor two weeks in a busy season. The owner probably blamed the tractor instead of his own negligence.

The axle of the main drive wheel is a place that most often suffers from lack of sufficient grease, since it takes so much more grease than most other parts of the tractor. When the operator has filled the grease cup in the morning, he figures that it will last him all day, while in most tractors the cups must be filled as often as every two hours.

THE WORLD SHORTAGE OF LIVESTOCK

A census of cattle in France reveals a decrease of 17 percent in beef animals, 38 percent in sheep and 40 percent in hogs since December 31, 1913. Italy

has suffered a loss of 21 percent of horses, 18 percent for mules, and 8 percent for swine. No one can even guess what the decrease in Germany, Austria, and Russia has been, but it must be enormous. According to a reliable estimate the decrease of livestock in all of Europe is equal to one-half the amount of livestock in America today. This estimate places the loss at 100 million head.

HOW TO FIND LAND FOR MORE WHEAT

The statistics of crop production in Ohio show that about six and a quarter million acres are annually given to the three principal crops—corn, wheat, and oats. During the twenty years, 1880 to 1899, two and a half million acres were given to wheat; two and three-quarter million acres to corn, and one million acres to oats; but since that

period there has been a shifting from wheat to oats and corn, and during the five years, 1912 to 1916, the area given to wheat had been reduced by 857,000 acres, while that given to corn had been increased by 290,000 acres and that to oats by 580,000 acres, or more than 50 percent. The acreage once in wheat might be returned to that crop again without any derangement of crop rotation, and to do so would add, at the average rate of production during recent years, more than thirteen million bushels to the bread supply of the state, or bread for half its five millions of people.

Garfield J. Wilder, '06, is secretary of The National Agricultural Lime-stone Association with offices in the Hartman building, Columbus, Ohio.

S. B. Stowe, '09, is county agent in Clermont county.

MAXIMUM PRODUCTION

Is now the battle cry for all Agricultural and Industrial Enterprises. Maximum Production calls for efficiency, the elimination of all waste. Maximum Production from cows necessitates feeding a balanced ration.

Can you do better for them or for yourself than by feeding "The Old Reliable"

Union Grains

"Quality in Feed  is Economy in Feeding"

Your dealer has Union Grains or can get it for you. Don't accept a substitute.

Write us for record sheet that will show whether you are securing maximum results from the ration you are now feeding.

Ubiko Milling Company
CINCINNATI, OHIO.

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SEPTEMBER NEWS ITEMS

NEW APPOINTMENTS MADE

Henry B. Froning, formerly instructor in the department of bacteriology, has been appointed instructor in the department of agricultural chemistry and soils.

Verle C. Smith, formerly secretary of the College of Agriculture, has been appointed assistant professor of farm crops in the agricultural extension service.

Rachel Edgar has been appointed assistant in department of agricultural chemistry and soils.

A. C. Workman has been appointed instructor in department of agricultural chemistry and soils.

Adolph Waller has been appointed instructor in the department of botany.

C. L. Metcalf, assistant professor in the department of zoology and entomology, has been granted leave of absence for the year 1918-1919.

BEES HAVE ROOF GARDEN

Buzz, buzz, buzz. Listen and you will hear them when you pass the botany and zoology building. The roof at the rear of the building has been converted into a roof garden for bees, and they are very happy ones, too. The bees, which are mostly Italians, belong to Prof. James S. Hine of the department of zoology and entomology. Professor Hine conceived the idea of using this section of the roof for bees over a year ago. Last year they did not make much honey, but are making up for it this season.

NEW RULING IS IN ORDER

The products of the University farm are no longer available to the public,

according to a ruling which took effect June 30. The demnad for vegetables and dairy products at the Ohio Union for the feeding of the soldiers stationed here made it seem desirable to divert them to their use.

NEW HOME STUDY COURSES

The following new home study courses are offered by the agricultural college extension service: Swine Farming, by J. S. Coffey, in five lessons; Farm Power, by H. C. Ramsower and G. W. McCuen, in eight lessons; Clover Culture, by A. E. Waller, in seven lessons; Grasses, by A. E. Waller, in seven lessons.

Application for enrollment should be made to J. E. McClintock, supervisor of correspondence courses, the Ohio State University.

SHEEP ON THE CAMPUS

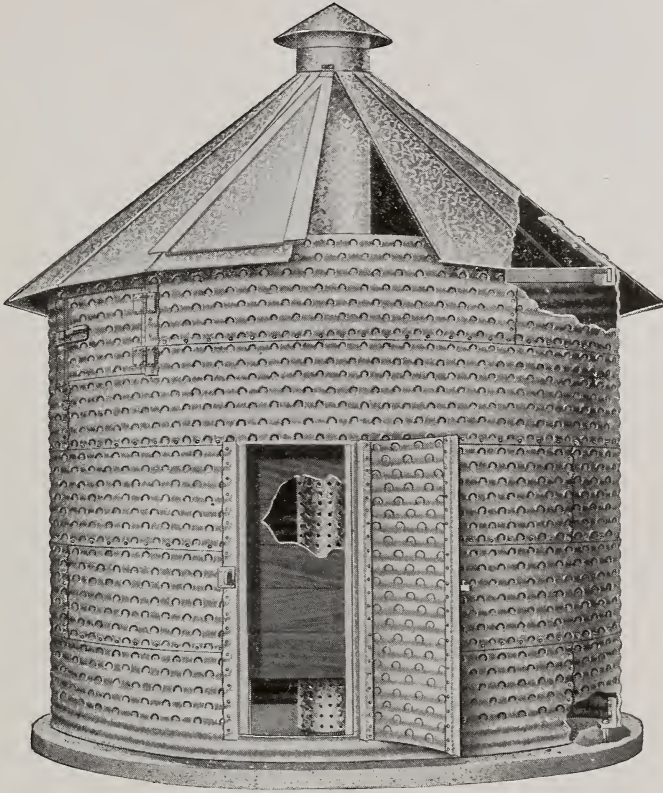
Sheep are assisting the mower on part of the campus situated along Eleventh Avenue and High Street. They may be found there from 5:45 to 11 a. m. and from 1 to 4.30 p. m. At noon they are driven back to the sheep barns where they are watered and allowed to rest in the shade.

COUNTY AGENT SUPERVISORS

Four district supervisors of county agent work have been recently appointed. The men selected for these places have been taken from the counties in which they have been serving as agents. R. D. Long, of Cuyahoga county, is the new supervisor for northeastern Ohio; C. A. Mahan, of Sandusky, for northwestern Ohio; W. W. Brownfield, '12, of Washington county,

Martin "Corn-Saver"

Metal Cribs and Bins



If you store your corn, wheat or oats in a Martin, you take no chance of loss from rats, mice, birds, thieves, mould or fire. The Crib will pay for itself in a season. It is cheap, is easily erected, will last a lifetime.

— See Our Exhibit at the Ohio State Fair —

NATIONAL STEEL PRODUCTS CO.

Box 342—Mansfield, Ohio

for southeastern Ohio; and George R. Eastwood, of Miami county, for southwestern Ohio.

It will be the duties of these men to visit the several county agents in their districts, particularly the new agents, to assist them in a general way with the conduct of their projects. The headquarters of the supervisors will be at the Ohio State University.

DAVID S. WHITE MADE LIEUTENANT COLONEL

Dr. David S. White, dean of the College of Veterinary Medicine, on leave of absence for military service, has been promoted to lieutenant colonel and is now in France, where he will have entire command of the veterinary service of the American Expeditionary Forces.

Nearly a year ago Colonel White left the University to accept a commission as major, and since then has been stationed in Washington.

CLUB MEMBERS PREPARE BIG STATE FAIR EXHIBIT

Upward of 50 members of boys' and girls' pig, poultry, and food clubs are expecting to be present at the State Fair to conduct demonstrations and to compete for prizes. Individual and club exhibits will be made of pigs, poultry, and canned fruits and vegetables. Two special tents will be required for the exhibition.

It is planned that the boys and girls who come will form teams of three persons each from the several local clubs represented.

NEW INSTRUCTOR

Benjamin Lee Thompson, '08, is now a specialist in animal husbandry in the agricultural extension service. He was appointed July 1. Mr. Thompson has

been associate professor of animal husbandry at the South Dakota State College.

Tom Stone, instructor in animal husbandry, resigned during the summer to take a position in the agricultural extension service of the Iowa State College.

ANIMAL HUSBANDRY NOTES

Prof. Charles S. Plumb of the department of animal husbandry has reconsidered his resignation, which was turned in early in July, and will continue his work with the University.

This will not interfere with the plans which he had made previous to his retirement, when he had intended writing a new book and revising old ones.

The students and alumni are mighty glad to hear that Professor Plumb has reconsidered his resignation as his influence has been strongly felt in animal husbandry circles.

WAR LIMITS SUPPLY OF BEST WHEAT FERTILIZER

The war, which has increased the demand for acid phosphate, has also made it difficult to obtain Spanish pyrites. These are used in the production of sulphuric acid, which is necessary for the manufacture of acid phosphate from phosphate rock. Furthermore, Uncle Sam is using enormous amounts of sulphuric acid in the manufacture of munitions.

In those counties where an organized effort was made to obtain it for use on wheat, it appears that sufficient acid phosphate is available for all use. Until the war is over, however, the supply of acid phosphate will continue to be more or less uncertain.

Just as acid phosphate was utilized to supplement the diminishing supply of bone meal, so will phosphate rock be

Feed Well in Flytime

Dairymen are coming more and more to realize that feeding a good grain ration on grass is essential to making the most money out of the dairy business.

The feeding of grain with pasture is more than justified by the extra yield of milk which comes at the time the summer grain is being fed. It pays a nice margin of profit over and above what the grain costs.

BUFFALO CORN GLUTEN FEED

But the big results, the most important part of the profit, come after the cows have been taken off the grass and are in the barn for the heavy milking season, when milk prices are up.

Dairymen know from experience that they make out far better with their herd by feeding Buffalo Corn Gluten Feed now than they possibly could not feeding it.

When cows have to fight flies and heat all day long, dusty tough grass stubble is more of an aggravation than anything else.

Men who feed Buffalo Corn Gluten Feed the whole year through are making more than a living out of the dairy business.

NOTICE: Keep the branded Buffalo Corn Gluten Food sacks together and take them to your dealer for refund.

Write us for sample and particulars



CORN PRODUCTS REFINING CO.
CHICAGO NEW YORK

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SAVE

We will Dry Clean your old suit, or your brother's — reline, repair and alter to late style. The result will surprise you.

**We are among the few
who can make you an
"All Wool" Suit.**

THE LEHMAN COMPANY

1666 NORTH HIGH

Near 12th Ave.

**FURNISHING GOODS
JEWELRY**

used at least until sulphur deposits are developed in meeting the increasing demand for phosphorus, according to Myron A. Bachtell, soils specialist of the Ohio State University.

For 20 years the Ohio Agricultural Experiment Station has been studying the possibilities of the use of this material. The most promising method of application has been to mix the raw rock with manure either in the stable or in a covered barnyard. The rate of application has been 40 pounds per ton. Eight tons of manure were applied to clover sod and plowed under for corn. The average increased yield per acre for 18 years has been 8 bushels of corn, 4 bushels of wheat, and 750 pounds of clover. If corn is worth \$1.50 a bushel, wheat \$2 a bushel, and clover hay \$20 a ton, the value of the increase produced by rock phosphate would be \$27.50. The cost of the 320 pounds of rock phosphate at the present time, delivered to most points in Ohio, need not exceed \$1.50. Instead of 40 pounds per ton of manure, Professor Bachtell believes that the amount used may well be increased to double this quantity and even more.

USE SWEET APPLES

TO SAVE SUGAR

Sweet apples may be utilized to save sugar during the present season according to the Department of Horticulture, Ohio Experiment Station. Sweet apples may be used in a limited way for a number of culinary purposes, canning and making of butters, and will require very little sugar for baking. Baked sweet apples may be used in place of the more expensive apple pie.

Old orchards frequently have a large number of sweet apple trees and the fruit in former years was generally dis-

Prof. J. W. Rader's

Private Academies of Dancing

NEIL AVE. ACADEMY

647 Neil Ave. Phones: Citz. 4431; M. 6189

SEASON 1918-1919

Fall Term's Calendar—Season's Openings

Beginners' Classes Tuesday evening, Sept. 10, and Friday evening, Oct. 4, 7:30 o'clock. First lesson.

Advance Class Monday evening, Sept. 23.

Reception Night Thursday evening, Sept. 19.

Reception Night Saturday evening, Sept. 21 (front hall).



Dance Correct

NEIL AVE. PAVILION

Open Friday and Saturday evenings.

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A strictly private place for Club Dances and Private Classes that organize for special instructions.

TUITION:

Gentlemen, per term of 10 lessons.....	\$6.00
Ladies, per term of 10 lessons.....	5.00
Private lessons, \$1.00; seven for	6.00

Tuition can be paid \$1.00 per week until paid.

Private lessons can be had afternoons or evenings.

The Waltz, Two-Step and the late modern dances taught in one term.

NITRATE AGENCIES CO.

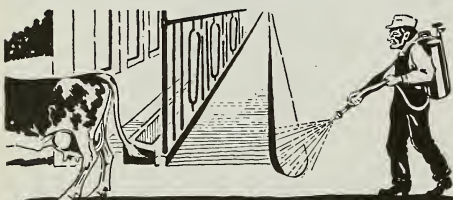
Nitrate of Soda, Acid Phosphate, Nitrapo (18% Am., 15% Pot.) and all fertilizer materials for prompt shipment at all times from convenient distributing points.

ALSO 60% DIGESTER TANKAGE.

Write in.

Central Nat'l Bank Bldg.

Columbus, Ohio.



CHASE DISEASE GERMS

Make it impossible for them to live in your cow barn. It's easy. Just spray the gutters and floors with a powerful disinfectant. It will protect your valuable dairy cattle. Use

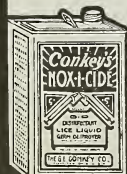
Conkey's NOX-I-CIDE

And you'll keep deadly epidemics out of your herd. Nox-i-cide mixes with water and makes a most economical disinfectant.

1 Gallon.....\$1.75
5 Gallon.....\$7.50

If your dealer don't sell Conkey's, write us direct.

The G. E. Conkey Company,
113 Conkey Bldg.,
Cleveland, Ohio
Send 10c in stamps for 224 page Stock Book.



Don't
Worry!
Conkey
Will Cure
Me

regarded, allowed to waste, or was fed to livestock. The scarcity of sugar will make it profitable to use the sweet apples now. In the past, too, sweet apples were regarded as possessing but little value for cooking purposes and their baking qualities were often ignored.

Varieties of sweet apples recommended for kitchen use are Sweet Bough, Golden Sweet, Munson, Bailey Sweet, Tolman, Paradise, and Bently, these being named in order of their appearance thruout the season.

COTTONSEED MEAL FOR CALVES

Probably few dairymen have fed cottonseed meal to young growing calves, but in an instance that lately came to my notice, this was being done, with disastrous results. The herdsman was running a dairy of some thirty-five cows, and much to his bewilderment was losing a large percentage of his calves, which he was attributing to various causes. It was discovered that he was feeding about one-half pound of cottonseed meal mixed with the skimmilk. At two experiment stations, death has been the result of feeding cottonseed meal in the skimmilk, and I believe that the cause for the unfortunate experiences of this herdsman can be attributed to the use of cottonseed meal. Why do we need any more protein with skimmilk?

C. H. S.

MANURE

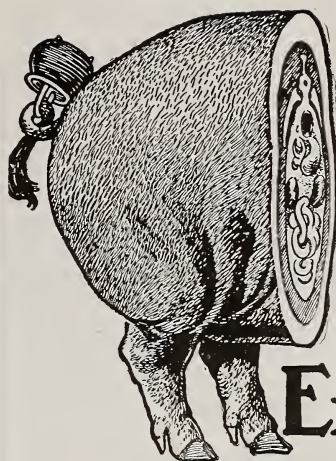
In these days of high prices and strict economy, is every farmer looking after one of his most valuable assets, namely, manure? A few plain facts may emphasize how easily improperly cared for manure loses its fertility. The general opinion among farmers is that the solid excrement is more valuable than the liquid excrement, but the liquid excrement

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ment is equally if not more valuable. The urine of cows, horses, and sheep carries more nitrogen and potash than the solid excrement; only in the case of swine does it carry less. Also, as shown by a New Jersey experiment, the nitrogen in the liquid excrement was much more readily available to the plant than was that in the solid excrement. Many farmers use plenty of bedding to absorb the liquid excrement, then they throw it into an open barnyard where the rains wash most of it out. Think of the labor and fertilizer wasted.

At the Cornell Experiment Station, horse and cow manure that was exposed to the weather for five months (April to September) lost 62 percent and 30 percent respectively, of their fertility. It is conservative to say that open barnyard manure is about half as valuable as fresh manure. Manure loosely piled in the barnyard affords ideal conditions for hot fermentation, with the consequent loss of nitrogen. One of two things ought to be done with all the manure produced, if its fertilizing value is to be preserved: (1) Haul directly from barn to field, or (2) store it in covered sheds to prevent leaching. If possible, a floor of some watertight material should be provided to prevent the escape of any liquid excrement not absorbed by the bedding. To prevent hot fermentation the manure must be kept compact and moist. Any cattle in the yards should be allowed to trample it and hogs can work on it without much danger of loss. Besides being a storehouse for manure, the shed will furnish shelter for the farm animals, which will in turn compact the manure so that hot fermentation is eliminated.

C. H. S.



**1
3
of a
Hog
Extra**

PURINE PIG CHOW is made of digester tankage, corn, molasses, alfalfa flour and a small percentage of humus and salt. This combination builds bone and muscle rapidly and puts on fat during the growing period.

PURINA Pig Chow

is rich in growth-promoting proteins, providing an abundance of amino acids, lysine and tryptophane (almost absent in corn). It insures a large frame (contains calcium and phosphates) and provides an abundance of elements for flesh, hair, blood and nerves.

Purina Pig Chow insures large digestive capacity and proper regulation.

Let your Research Department pass on some further interesting data concerning Pig Chow to you.

**RALSTON
PURINA
MILLS,
967 Gratiot St.,
St. Louis, Mo.**



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Prominent Livestock Breeder's

We recommend them to be
reliable and safe.

Hampshire Pigs

FROM

Big, quick maturing,
typy sows
are bound to produce
cheap pork.

That white belt means
something.

Wm. Laurens
Xenia, Ohio

TIPBURN CAUSES LOSS IN POTATO FIELDS

Tipburn rather than late blight has been the cause of the dying off of the potato crop according to the botanists at the Ohio Experiment Station. Tipburn is due to excessive dry weather when it is impossible for the potato plant to take up as much water from the soil as it gives off into the air; hence the leaves burn.

Other diseases may attack the potatoes during tipburn causing heavier loss. Spraying is recommended to keep the foliage healthy and will form a potato insurance, growers say. If late blight appears later spraying will tend to hold it in check altho the late blight makes its appearance in cool, wet weather.

Bordeaux mixture sprayed on the vines every two weeks is a form of potato insurance. It is made by dissolving four to six pounds of copper sulphate in four gallons of water and slaking four pounds of quicklime and then pouring the two solutions together and diluting with water to 50 gallons. Cloudy weather or periods when the sun is not too hot is best for spraying as a scald may develop in hot weather. Any practice which will keep the vines green and healthy will aid in potato production, botanists say.

MERIDEL FARM DUROCS

The Popular Kind.

SEE US AT THE STATE FAIR

MERIDEL FARM, BLACK LICK, OHIO

Where Good Sows and Good Boars Meet

On East Broad Street, 9 Miles East of Columbus.

2 Miles from Black Lick.

3 Miles from Reynoldsburg.

There is Just One Sire in the World with Six Daughters Above 1,000 lbs. Butter—That Sire Is

PONTIAC AAGGIE KORNDYKE

He is the Greatest Long Distance Sire in the World.

And here's the best part of the ability of his daughters—they can make over 30 lbs. in a week, for 13 have done it and many more are to follow.

His breeding? It is the best—a son of Pontiac Korndyke from a daughter of Hengerveld De Kol—just like King of the Pontiacs, Korndyke Abbekerk, Pontiac Korndyke, Hengerveld De Kol, and other great sires.

His sons that we have for sale are largely from daughters of Friend Hengerveld De Kol Butter Boy, the best long distance son of De Kol 2d's Butter Boy 3d—the one son that sires world's champion yearly producers.

It's surprising the number of bulls of this combination that have found their way both east and west. It is the winning combination and one you cannot afford to go on without using.

**MAPLECREST STOCK FARM COMPANY,
CHARDON, OHIO**

BELL BROTHERS

**Are Making a Large Exhibit at the 1918 Ohio State
Fair of the Best Imported**

Percheron and Belgian STALLIONS

We Are Especially Strong in Three Year Old Belgians, Having Five in the Class.

BE SURE TO TO SEE THIS EXHIBIT.

BELL BROTHERS, WOOSTER, OHIO

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STORED MANURE RETURNS HIGHEST CROP YIELDS

After 20 years of experimental work at the Ohio Experiment Station, figures show that the careful saving of manure is one of the most profitable measures for making land more productive. Test in a 3-year rotation of corn, wheat, and clover where 8 tons of stable manure was applied in the rotation

show a return of \$57 from the effects of the manure or a crop return of approximately \$7 for every ton used. At present prices of crops the 10-dollar mark would be reached. Where ordinary barnyard manure was used \$46 was returned or \$11 less as compared with stable manure. This means a return of \$1.25 more for every ton of manure stored and handled to prevent leaching from rains.

When the same amounts of manure were used in connection with 320 pounds of acid phosphate to the acre in the rotation an increase of \$90 was recorded with the combination of acid phosphate and stable manure. With the barnyard manure, however, only a 79-dollar increase was secured, showing again that stable manure will return approximately \$1.25 a ton more than barnyard manure. In both cases an increase of \$32 worth of crops was returned for the application of 320 pounds of acid phosphate, over and above the increase from manure alone, a return of \$7 for every dollar invested in acid phosphate.

Conservation of manure is mentioned by the Experiment Station officials as a wartime matter not only to substitute for high-priced fertilizers but also to increase crop yields.

BLACKWOOD, GREEN & CO.

HARDWARE

General Hardware and Sheet
Metal — Manufacturers of
Special Laboratory
Apparatus.

624 N. HIGH, COLUMBUS, O.

The Agricultural Student The Ohio Farmer

ONE YEAR

\$1.50

PAINT FOR EVERY PURPOSE

Conserve the beauty of your buildings and protect them from decay by painting them with Blackstone Pure Mixed Paint. House Paint, \$2.80 gal. Barn Paint, \$1.75 gal. Roof Paint, 40c gal. Liquid Roof Cement, 75c gal. All guaranteed. Write for color cards.

AUTOMOBILE OILS

Direct to you at wholesale prices: Our Ford Special, refined and prepared especially for use in Ford and other High Speed engines in 30 or 50 gallon barrels, 48c gal.; Blackstone Light Auto, 65c gal.; Blackstone Medium Auto Oil, 75c gal.; Blackstone Heavy Auto Oil, 65c gal.

Our oils are refined from the best Pennsylvania stock, are free from dirt or grit and will stand any test. Satisfaction guaranteed or money refunded.

Keep a barrel on hand.
stand any test. Satisfaction guaranteed or money refunded.

THE BLACKSTONE OIL & PAINT CO.

Reference—The Union Commerce National Bank.

CLEVELAND, OHIO

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Spain Shoe Store

2063 NORTH HIGH

The Best Place Near the Cam-
pus to Buy Shoes and Men's
Furnishings. Prices to Suit You

Clean, Wholesome, Well-Served Food, ^{PRICES} _{REASONABLE}

NORTH SIDE RESTAURANT

2075 North High Street

Between Woodruff and Frambes

No Better Clothes than Mendel's at Any Price

Suits Made and Guaranteed to Fit From \$18 to \$40.

MENDEL

545 N. HIGH ST., 4 Doors South of Goodale St. Usual Prices Prevail.

E. S. ALBAUGH

Manufacturing Jeweler

Twenty East Gay St.

The Jewelry Shop

FRATERNITY & CLASS PINS
LODGE EMBLEMS

Automatic Phone 8017

HENNICK'S CONFECTIONERY

The one place around
the campus where you
can get good things to
eat and drink.

COLLEGE BOOK STORE

AGRICULTURAL BOOKS,
New and Second Hand

KENEDY'S CONFECTIONERY, 1616 N. High

GOOD THINGS TO EAT AND DRINK.

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FOODSTUFF SHIPMENTS TO THE ALLIES

HERBERT HOOVER
United States Food Administrator

[In the mass of material printed concerning the achievements of the Food Administration we are likely to lose sight of the essential data. Unfortunately, too, official reports frequently are given slight consideration. The following article by Mr. Hoover is not only official but is cleancut and well worthy of careful reading.—Ed.]

IT is now possible to summarize the shipments of foodstuffs from the United States to the Allied countries during the fiscal year just closed, particularly the last harvest year. These amounts include all shipments to Allied countries for their and our armies, the civilian population, the Belgian Relief, and Red Cross. The figures indicate the measure of effort of the American

people in support of Allied food supplies.

The total value of these food shipments, which were in the main purchased thru or with the collaboration of the Food Administration, amount to, roundly, \$1,400,000,000 during the fiscal year.

The shipments of meats and fats (includes meat products, dairy products, vegetable oils, etc.) to Allied destinations were as follows:

Fiscal year:	Pounds
1916-17 -----	2,166,500,000
1917-18 -----	3,011,100,000
Increase -----	844,600,000

Our slaughterable animals at the beginning of the last fiscal year were not

IF YOU HAVE YOUR PHOTO MADE BY

THE OLD
 RELIABLE

Baker Art Gallery
 COLUMBUS.O.

STATE and
 HIGH STS.

IT WILL ALWAYS BE BETTER

Our photos are the most durable. We excel in the large variety of Exclusive Styles and Artistic Finish.

SPECIAL RATES TO ALL UNIVERSITY STUDENTS

Marzetti Restaurant

1548 NORTH HIGH STREET

WE BAKE OUR OWN PIES

SHORT ORDERS OUR SPECIALTY

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MARGARET NADDY TURKOPP

—OF—

The Emerson Dancing Academy

extends to our agricultural students a most cordial invitation to attend her Academy of Dancing for instruction in private or class work and also the Assembly's Fridays and Saturdays. Friday being exclusively for the College and High School age.

Complimentary Opening, Friday September 27, 1918

Other Classes, Monday and Wednesday

Assembly Every Saturday—Come

Information Given Cheerfully by Phone—North 5902—11958

Childrens Opening Saturday, October 5, at 2 o'clock



COLUMBUS, OHIO.

appreciably larger than the year before and particularly in hogs; they were probably less. The increase in shipments is due to conservation and the extra weight of animals added by our farmers. The full effect of these efforts began to bear their best results in the last half of the fiscal year, when the exports to the Allies were 2,133,100,000 pounds, as against 1,266,500,000 pounds in the same period of the year before. This compares with an average of 801,000,000 pounds of total exports for the same half years in the three-year prewar period.

In cereals and cereal products, reduced to terms of cereal bushels, our shipments to Allied destinations have been—

Fiscal year:	Bushels
1916-17 -----	259,900,000
1917-18 -----	340,800,000
Increase -----	80,900,000

Of these cereals our shipments of the prime breadstuffs in the fiscal year 1917-18 to Allied destinations were, wheat 131,000,000 bushels, and of rye 13,900,000 bushels, a total of 141,900,000 bushels.

The exports to Allied destinations during the fiscal year 1916-17 were, wheat 135,100,000 bushels and rye 2,300,000 bushels, a total of 137,400,000 bushels. In addition, some 10,000,000 bushels of 1917 wheat are now in port for Allied destinations or en route thereto. The total shipments to Allied countries from our last harvest of wheat will be, therefore, about 141,000,000 bushels, or, a total of 154,900,000 bushels of prime breadstuffs. In addition to this we have shipped some 10,000,000 bushels to neutrals dependent upon us and we have received some imports from other quarters. A large part of the other cereals exported have

“Ohio State”

Pillows - Pennants - Banners

Fountain Pens

THE H. K. SMITH CO.

15th and High—11th and High

What's the Sense

In urging housewives to save crumbs and crusts, while brewers are wasting 3,150,000 bushels of nutritive food value every month in making beer Herbert Hoover says they are doing this, and Hoover knows.

What's the Sense

In allowing but two pounds of sugar per month to each member of the family, while the brewers last year were permitted to use 64,000,000 pounds in making beer?

Let's stop this waste, so far as Ohio is concerned, by voting the state dry.

Vote "Yes" on Prohibition November 5th

OHIO DRY FEDERATION,
J. A. White, Campaign Mgr., Columbus, O.

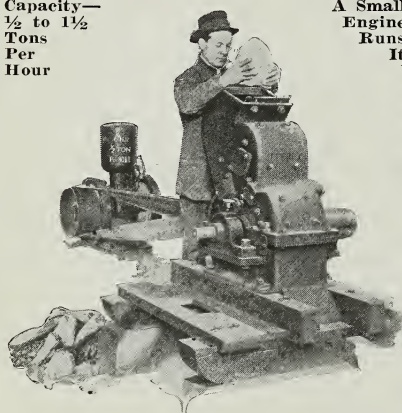
also gone into war bread.

It is interesting to note that since the urgent request of the Allied Food Controllers early in the year, for a further shipment of 75,000,000 bushels from our 1917 wheat than originally planned, we shall have shipped to Europe or have en route, nearly 85,000,000 bushels. At the time of this request our surplus was already more than exhausted. This accomplishment

of our people in this matter stands out even more clearly if we bear in mind that we had available in the fiscal year 1916-17 from net carry-over and as surplus over our normal consumption about 200,000,000 bushels of wheat which we were able to export that year without trenching on our home loaf. This last year, however, owing to the large failure of the 1917 wheat crop, we had available from net carry-over and production and imports, only just about our normal consumption. Therefore our wheat shipments to Allied destinations represent approximately savings from our own wheat bread.

Capacity—
½ to 1½
Tons
Per
Hour

A Small
Engine
Runs
It



Farmers Everywhere Have Been Waiting For The Jeffrey Lime-Pulver Junior

This machine will grind any dry friable material such as Limestone, Marl, Oyster Shells for Agricultural Lime; Corn, Shells, Charcoal, etc., for Chicken feed; Ear Corn, Oats, Velvet Beans, etc., for Stock Feeding; Alfalfa Hay, Pea Vines, etc., to meal for protein feeds.

Write for full particulars.

The Jeffrey Manufacturing Co.
507 N. Fourth Street, COLUMBUS, OHIO.

CRUSHING LIMESTONE

Where a group of farmers live in a limestone section, it is often more profitable for them to buy a crusher and make their own limestone rather than send away for it. Cooperative ownership makes such work possible for owners of small farms. At the Hamilton County Experiment Farm it was found there was a difference of \$1.50 a ton in favor of limestone crushed on the farm.

Small portable crushers are now sold for grinding limestone. Several farmers together may buy such a crusher, when the price is prohibitive for one individual having but little stone to crush.

FALL LIMING

We urge all to order their Fall requirements for the Wheat Crop **RIGHT NOW**. Haul it home as soon shipments can be made.

Car shortage still confronts the Manufacturer and he must have ample notice of the tonnage required to Lime a portion of your farm.

There is no longer any question in regard to the **NEED** of Limestone. It is a question of **HOW TO OBTAIN IT**. We will be glad to meet you and to help you.

We are daily in touch with the entire Industry throughout Ohio.
See our exhibit at **STATE FAIR**.

THE NATIONAL AGRICULTURAL LIMESTONE ASSOCIATION

406 HARTMAN BUILDING, COLUMBUS, OHIO.

G. J. WILDER, Secretary.

LIMING YOUR LAND

Have you satisfactorily settled the question of liming your land this fall? In many localities this practice is uncommon, perhaps because no one started it or it fell out of use before the present generation. The use of lime was common long before the Christian era. The Chinese used it, but more as an insecticide than for the effects it would have on the soil. The practice of liming the soil was introduced into France and England by the Romans, and was spoken of by early Roman writers. In eastern Ohio the need for lime is imperative, while the western soils have a greater natural supply. If a farmer is contemplating the use of lime, he naturally asks himself, "What are the benefits that will accrue from such use?" Briefly, they are these: Lime neutralizes the acidity of the soil, and not only benefits one crop but succeeding crops; it will aid in putting a hard, puddled soil into proper tilth; many forms of beneficial bacteria cannot live in acid soils, while in limed or sweetened soils they thrive; lime, altho it contains no minerals such as phosphorus or potassium, yet may give much the same results when applied to the soil as a light application of the fertilizer that does contain these minerals. This is due to the fact that potassium and phosphorus are usually held in combination with iron and aluminum, which is an unavailable form. Liming the soil tends to cause the iron and aluminum to give up the phosphorus and potassium.

As to the form of lime to be used, the farmer must decide that for himself, for the price is the deciding factor. Ground limestone should be considered carefully by the one contemplating liming the soil. Being a natural product,

PULVERIZED LIMESTONE

**Is the Best Form
of Lime to Use
on the Soil.**

For Service

**Prompt Delivery
Satisfactory Dealing**

For Finely

Pulverized Material

**"BESSEMER"
Pulverized Limestone**

Has No Superior.

BESSEMER LIMESTONE CO.

714 Stambauhg Bldg.

Youngstown, Ohio

it can be used in any quantity, without any danger of injury to the soil. Experiments have shown that two tons of limestone are as efficient as one ton of quicklime, provided the former is finely ground. Limestone is considered finely ground when three-fourths of it will pass thru a sieve having 100 meshes to the inch.

All forms of lime should be purchased on the basis of the calcium oxide or cal-

cium carbonate which they contain. Let us look into this problem carefully and see if an application of lime would not make a profitable investment.

WHAT SHANK COLOR SHOWS

Poultrymen who keep yellow shanked chickens have an excellent guide as to what the previous egg record of the hen has been. It is safe to state that the absence of shank color in yellow shanked varieties indicates that the hen has been a good producer, while an abundance of yellow color in the legs indicates just the opposite. This is true in except in localities where the soil is of such a nature as to bleach the shanks. The shank color is due to a yellow pigment in the fat known as xanthophyll. When a hen lays, there occurs a movement of this fat into the blood circulation and as a result the yellow pigment is taken up and deposited with the fat in the yolk of the egg. Consequently, the shanks fade. The more eggs laid the greater the fading. Of course, this does not occur all at once but gradually. By August 1 a good laying hen will show pink shanks, while the shanks of a poor layer will be yellow. After a few weeks in which the hen is not laying the color will return; but if a person wants to pick out good layers as breeders for next year he should select those with pink shanks.

LOOK!

**The Agricultural Student
The Breeder's Gazette
The Ohio Farmer**

ONE YEAR

\$2.50

INCREASED PORK PROFITS

Every feeder knows the value of a balanced ration.
The hog needs added protein to make the best gains on corn.
The cheapest source of protein is 60 percent digester tankage.
The tankage par excellence is

PREMIUM DIGESTER TANKAGE

CAREFULLY compounded by

THE CLEVELAND PROVISION CO.

CLEVELAND, OHIO. (Dept. S.) ASK ANY FEEDER WHO HAS USED IT.

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UNITED STATES WAR EXHIBIT

—AT THE—

Ohio State Fair

Columbus, Ohio

The ARMY and NAVY will show Browning Machine Guns, Enfield Rifles, Mountain Guns, Trench Equipment, Aviator's Outfit, Depth Charges, Big Torpedoes, Projectiles and exact models of Battleships, Dreadnoughts, Cruisers and Destroyers.

The Federal Government wants to acquaint you with her war accomplishments. Accept this opportunity which is Free to Fair Visitors.

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All of This for You.

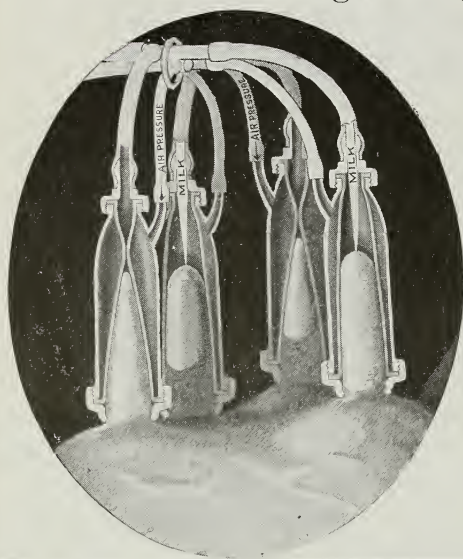
"IT'S YOUR FAIR."

Aug. 26-27-28-29-30, 1918

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

The Universal Natural Milker

The illustration shows how two teats are milked at a time, approximating hand milking. It also shows how the rubber lining massages the teats from the end



upward, thus approximating the calf's tongue when it is sucking and stops to swallow.

The cows like the **Universal** better than either the hands or the calf because of its gentle and regular action. Send for "No Stripping Booklet" and our new catalog.

UNIVERSAL MILKING MACHINE

218 West Mound St.
Columbus, Ohio

PURITY

You may not be able to control the original quality of the milk, but you can easily protect it from loss, if the proper cleaning material is used. Milk utensils washed with

Wyandotte
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In Every Package

are considered by experts who understand milk production as being free from everything that might cause the milk to become impure.

Ask your dealer to fill your order for this cleaner.

IT CLEANS CLEAN

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Soldiers of the Soil

FARM SERVICE Division Facts

1. Organized in February, 1918, as a Division of the U. S. Employment Service, Department of Labor, to work out problems of mobilization and distribution of farm labor.

2. Works through machinery in each state of the U. S. Employment Service, U. S. Public Service Reserve and U. S. Boys' Working Reserve. Has Senior Examiner in each state under State Director of the U. S. Public Service Reserve devoting entire time to farm labor matters.

3. Co-operates with State Agricultural Agencies, Fourth Class Postmasters, State Councils of National Defense and many unofficial organizations for relieving farm labor shortage.

4. Has demonstrated its practical efficiency this season by making the harvest of the second largest wheat crop ever produced in this country "Safe for Democracy."

MILLIONS of our Allied fighters and still another million and more of OUR OWN fighting boys are "over there." All these millions and millions of civilian populations as well are looking to America for the wheat, the fats, the sugar and the meats that are to sustain the cause of Democracy in its fight.



Unless you have heard the call to the fields of France, hear your Government's call for "Soldiers of the Soil." If you have had farm experience find your place in the great agricultural army that Uncle Sam is mobilizing to "carry on" and furnish the will that our armies need to bring Victory.



Volunteer today. The need is urgent.



Go to your State U. S. Farm Service Organization, or write to the

FARM SERVICE DIVISION

U. S. EMPLOYMENT SERVICE

U. S. Dept. of Labor

W. B. Wilson, Sec'y

Washington, D. C.

This Advertisement Contributed to the Winning of the War by
THE AGRICULTURAL STUDENT.

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“Slipping” not “Saving”

“I kept slipping back two feet every time I went ahead one.” That’s what the small boy gave as an excuse to his teacher for being late for school one winter day.

And that’s just what is happening to the cow owner who is trying to get along without a cream separator or with an inferior or half-wornout machine. Like the small boy he is “slipping.” He thinks he is thrifty, but for every dollar he saves by not buying a De Laval he loses two through not having one.

It ISN’T economy to do without labor saving and money saving and food saving machines. It ISN’T economy to feed 40-cent butter to the calves and hogs.

It IS economy to buy and use only the best cream separator made—and that’s the De Laval.

Viewed from every standpoint—clean skimming, ample capacity, ease of operation, freedom from repairs, durability—there is no other cream separator that can compare with the De Laval.

**It’s real thrift and genuine economy
to buy a De Laval Separator NOW**

Why not see the nearest De Laval agent at once! See a new 1918 De Laval machine for yourself. Try it to prove every claim made for it. If you don’t know a De Laval agent write direct to one of the addresses below.

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York.

29 E. Madison St., Chicago